PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN 2020 UPDATE

Volume I

Prepared for:

Passaic County Office of Emergency Management
Robert A. Lyons, County Coordinator

Prepared by:
Tetra Tech, Inc.
6 Century Drive, Suite 300
Parsippany, NJ 07054

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Passaic County and All Municipalities
Hazard Mitigation Plan 2020 Update

Volume I

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Prepared for:

Passaic County Office of Emergency Management

Prepared by:

TETRA TECH

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6 Century Drive, Suite 300

Parsippany, NJ 07054

TABLE OF CONTENTS

VOLUME I

VOLUME II

ACRONYMS AND ABREVIATIONS

REFERENCES

APPENDICES

SECTION 1. INTRODUCTION

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), Passaic County and the municipalities located therein have developed this Hazard Mitigation Plan (HMP), which represents a regulatory update to the *2015 Passaic County and All Municipalities Hazard Mitigation Plan* (HMP). The DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) and is designed to improve planning for, response to, and recovery from disasters by requiring state and local entities to implement pre-disaster mitigation planning and develop HMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for HMPs. The New Jersey Office of Emergency Management (NJOEM), also supports plan development for jurisdictions in New Jersey.

***Hazard Mitigation** is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.*

*FEMA defines a **Hazard Mitigation Plan** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.*

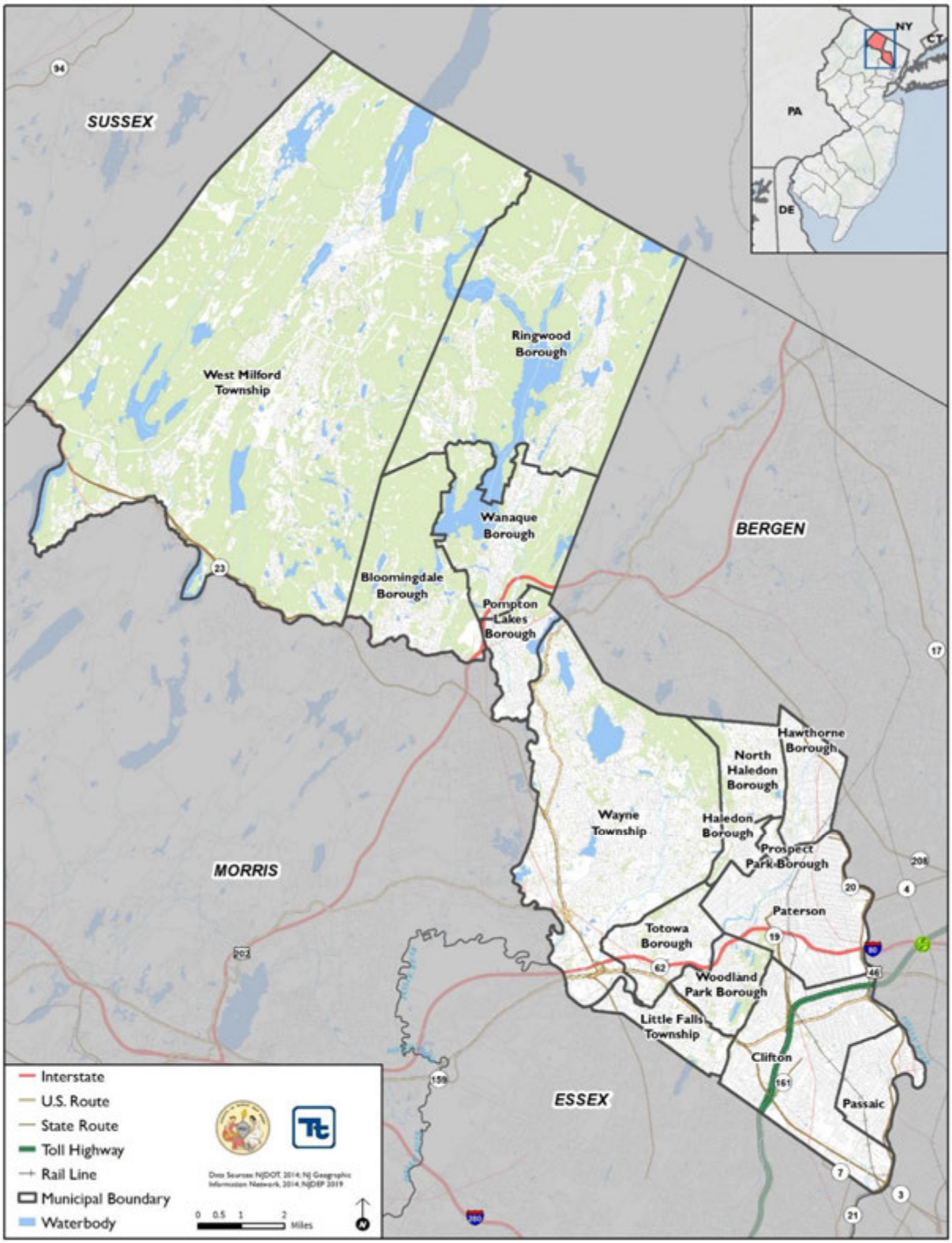
Specifically, the DMA 2000 requires that states, with support from local governmental agencies, develop and update HMPs on a five-year basis to prepare for and reduce the potential impacts of natural hazards. The DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. This enhanced planning better enables local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

Passaic County and all municipalities are participating in the plan update; refer to Table 1-1 and Figure 1-1.

Table 1-1. Participating Jurisdictions

Boroughs	
Bloomingdale	Prospect Park
Haledon	Ringwood
Hawthorne	Totowa
North Haledon	Wanaque
Pompton Lakes	Woodland Park
Townships	**Cities**
Little Falls	Clifton
Wayne	Passaic
West Milford	Paterson
Passaic County	

Figure 1-1. Passaic County New Jersey



1.1 DMA 2000 ORIGINS -THE STAFFORD ACT

In the early 1990s, a new federal policy regarding disasters began to evolve. Rather than reacting whenever disasters strike communities, the federal government began encouraging communities to first assess their vulnerability to various disasters and proceed to take actions to reduce or eliminate potential risks. The logic is that a disaster-resistant community can rebound from a natural disaster with less loss of property or human injury, at much lower cost, and, consequently, more quickly. Moreover, these communities minimize other costs associated with disasters, such as the time lost from productive activity by business and industries.

The DMA 2000 provides an opportunity for states, tribes, and local governments to take a new and revitalized approach to mitigation planning. The DMA 2000 amended the Stafford Act by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of requirements (Section 322). Section 322 sets forth the requirements that communities evaluate natural hazards within their respective jurisdictions and develop an appropriate plan of action to mitigate those hazards, while emphasizing the need for state, tribal and local governments to closely coordinate mitigation planning and implementation efforts.

The amended Stafford Act requires that each local jurisdiction identify potential natural hazards to the health, safety, and well-being of its residents and identify and prioritize actions that the community can take to mitigate those hazards—before disaster strikes. To remain eligible for hazard mitigation assistance from the federal government, communities must first prepare and then maintain and update an HMP (this plan).

Responsibility for fulfilling the requirements of Section 322 of the Stafford Act and administering the FEMA Hazard Mitigation Program has been delegated to the State of New Jersey, specifically to NJOEM. FEMA also provides support through guidance, resources, and plan reviews.

1.2 BENEFITS OF MITIGATION PLANNING

Mitigation planning forms the foundation for Passaic County's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. Mitigation planning also allows Passaic County, as a whole and with participating jurisdictions, to remain eligible for mitigation grant funding for mitigation projects that will reduce the impact of future disaster events. The long-term benefits of mitigation planning include the following:

National Benefit-Cost Ratio (BCR) Per Peril *BCR numbers in this study have been rounded	Beyond Code Requirements	Federally Funded
Overall Hazard Benefit-Cost Ratio	$4:1	$6:1
Riverine Flood	$5:1	$7:1
Hurricane Surge	$7:1	Too few grants
Wind	$5:1	$5:1
Earthquake	$4:1	$3:1
Wildland-Urban Interface Fire	$4:1	$3:1

Source: FEMA 2018; Federal Insurance Mitigation Administration 2018
Note: Natural hazard mitigation saves $6 on average for every $1 spent on federal mitigation grants.

- An increased understanding of hazards faced by Passaic County and their inclusive jurisdictions.
- Building more sustainable and disaster-resistant communities.
- Increasing education and awareness of hazards and their threats, as well as their risks.
- Developing implementable and achievable actions for risk reduction in the county and its jurisdictions.
- Building relationships by involving residents, organizations, and businesses.
- Identify implementation approaches that focus resources on the greatest risks and vulnerabilities.
- Financial savings through partnerships that support planning and mitigation efforts.
- Focused use of limited resources on hazards that have the biggest impact on the community.
- Reduced long-term impacts and damages to human health and structures.
- Reduced repair costs.

1.3 HAZARD MITIGATION PLAN OVERVIEW

The structure of this HMP follows the four-phase planning process recommended by FEMA and summarized in Figure 1-2. Table 1-2 summarizes the requirements outlined in the DMA 2000 Interim Final Rule and provides the section where each is addressed in this HMP. This HMP is organized in accordance with FEMA and NJOEM guidance. This plan was prepared in accordance with the following regulations and guidance:

- FEMA Local Mitigation Planning Handbook, March 2013.
- FEMA Integrating Hazard Mitigation into Local Planning, March 1, 2013.
- FEMA Plan Integration: Linking Local Planning Efforts, July 2015.
- Local Mitigation Plan Review Guide, October 1, 2011.
- DMA 2000 (Public Law 106-390, October 30, 2000).
- 44 Code of Federal Regulations (CFR) Parts 201 and 206 (including: Feb. 26, 2002, Oct. 1, 2002, Oct. 28, 2003, and Sept. 13, 2004 Interim Final Rules).
- FEMA How-To Guide for Using HAZUS-MH-MH for Risk Assessment FEMA Document No. 433, February 2004.
- FEMA Mitigation Planning How-to Series (FEMA 386-1 through 4), 2002, available at: http://www.fema.gov/fima/planhowto.shtm.
- FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013.

Figure 1-1. Passaic County Hazard Mitigation Planning Process

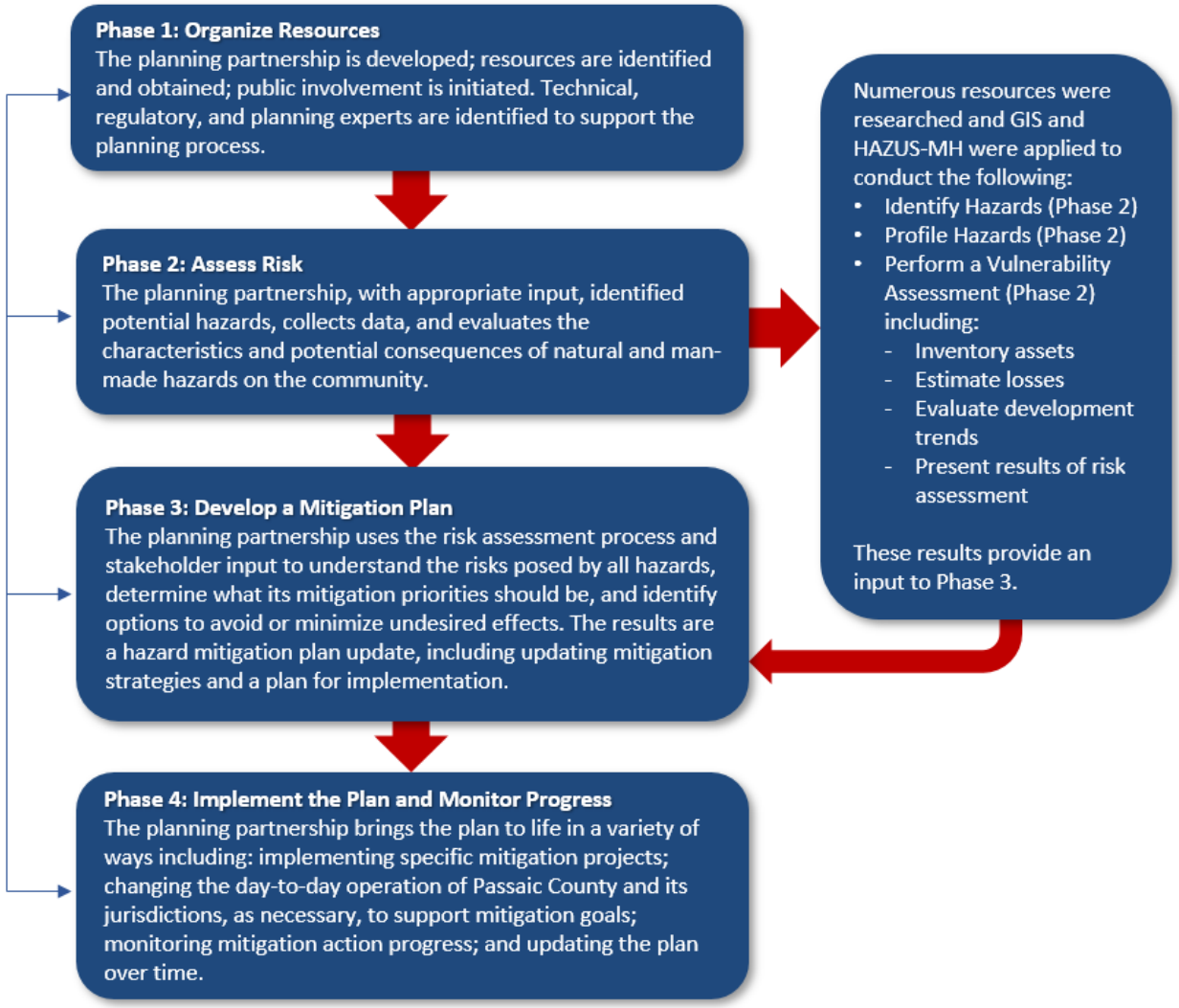


Table 1-2. FEMA Local Mitigation Plan Review Crosswalk

HMP Criteria	Primary Location in the HMP
Prerequisites	
Adoption by the Local Governing Body: §201.6(c)(5)	Section 1; Appendix A
Planning Process	
Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)	Section 2; Section 8
Risk Assessment	
Identifying Hazards: §201.6(c)(2)(i)	Sections 4.1
Profiling Hazards: §201.6(c)(2)(i)	Section 4.3
Assessing Vulnerability: Overview: §201.6(c)(2)(ii)	Section 4.3
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)	Section 3, 4.2, Section 4.3; Section 9
Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)	Section 4.3; Section 9
Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	Section 3; Section 4.3; Section 9
Mitigation Strategy	
Local Hazard Mitigation Goals: §201.6(c)(3)(i)	Section 6; Section 9
Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)	Section 6; Section 9
Implementation of Mitigation Actions: §201.6(c)(3)(iii)	Section 6; Section 9
Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)	Section 6; Section 9
Plan Maintenance Process	
Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i)	Section 7
Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)	Section 6, 7; Section 9
Continued Public Involvement: §201.6(c)(4)(iii)	Section 7

1.4 PLANNING PROCESS OVERVIEW

Passaic County and the participating jurisdictions intend to implement this HMP with full coordination and participation of County and local departments, organizations and groups, and relevant state and federal entities. Coordination helps to ensure that stakeholders have established communication channels and relationships necessary to support mitigation planning and mitigation actions included in Section 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes).

During the Passaic County HMP planning process, the nation, the State of New Jersey and Passaic County were facing the COVID-19 pandemic. The COVID-19 pandemic was declared a major disaster on March 25, 2020 (DR-4488). The Governor issued a stay-at-home Executive Order beginning March 21, 2020, which remained in effect the duration of the planning process. Passaic County has been greatly impacted by the COVID-19 pandemic with 16,867 positive cases and over 1,000 confirmed deaths as of June 29, 2020.

The Passaic County Office of Emergency Management (OEM), Steering Committee members and the planning partners (County departments and municipalities) were facing the COVID-19 pandemic concurrent with completing the update to the HMP. Passaic County and all planning partners made their best effort to work through this unprecedented time to complete the HMP update and meet FEMA and State requirements. The majority of the public and stakeholder engagement strategy was implemented earlier in the planning process; however, an in-person Steering Committee draft review meeting was not scheduled, and a public draft HMP meeting was not held due to the Executive Order in place and for the safety of residents and all planning partners.

In addition, several public events that the HMP was to be presented were canceled due to the pandemic including the Emergency Awareness public meeting in the Borough of Pompton Lakes in March 2020, and a senior event at the Passaic County Camp Hope Commission on May 8, 2020. At both events, the HMP was on the agenda to be presented providing an opportunity to engage residents on the planning process and discuss vulnerabilities and survey mitigation options.

Instead, the Steering Committee continued to communicate via email and hold teleconference meetings to complete the review of the draft plan prior to submittal. The Passaic County OEM website was updated, and social media was utilized to advertise the draft plan posting. All planning partners were notified that the draft plan was posted for public and stakeholder review, were provided social media posts/images, and were asked to distribute these notifications in their jurisdictions. Last, stakeholders that were distributed the stakeholder surveys were notified via email that the draft plan was posted for public review and comment. Assistance with stakeholder survey distribution was provided by the Passaic County Department of Planning and Economic Development, Passaic County OEM and the municipalities as outlined in Section 2 (Planning Process). Public and stakeholder comments received on the draft plan were shared with the planning partners via email. To complete the update to the draft plan prior to submission to NJOEM, teleconference meetings were held in a best effort to complete jurisdictional annexes given staffing constraints during the active pandemic.

1.5 MULTIPLE AGENCY SUPPORT FOR HAZARD MITIGATION

Primary responsibility for the development and implementation of mitigation strategies and policies lies with local governments. However, local governments are not alone; various partners and resources at the regional, state, and federal levels are available to assist communities in the development and implementation of mitigation strategies. Within New Jersey, NJOEM is the lead agency providing hazard mitigation planning assistance to local jurisdictions. NJOEM provides guidance to support mitigation planning. In addition, FEMA provides grants, tools, guidance, and training to support mitigation planning.

The Passaic County OEM and the Steering Committee provided project management and oversight of the planning process. Participating jurisdictions were asked to identify a primary and alternate local point of contact (POC) to be members of the Planning Committee and lead the planning process update on behalf of the jurisdiction. At the start of the planning process, each municipality identified their National Flood Insurance Program (NFIP) Floodplain Administrator (FPA) and requested their involvement. Further, each jurisdiction was encouraged to form a 'mitigation team' comprised of representatives across departments to ensure broad participation, share the work of the update process and ensure accurate information was captured in their chapter, or annex.

Steering Committee (SC) *is comprised of County and municipal representatives that guide and lead the HMP update process on behalf of the Planning Partnership.*

Planning Committee (PC) *is comprised of representatives from each participating jurisdiction (County and municipalities).*

Planning Partnership = SC + PC

The municipal mitigation teams worked directly with the primary and alternate POCs, and the NFIP FPA and contributed to the jurisdictional annexes presented in Section 9. Together, the Steering Committee and Planning Committee are referred to as the Planning Partnership for the Passaic County HMP update. A list of Steering Committee and jurisdiction POCs is provided in Section 2 (Planning Process), while Appendices B (Meeting Documentation) and Appendix C (Participation Documentation) provide further documentation of the broader level of municipal involvement. Additional input and support for this planning effort was obtained from a range of agencies and through public and stakeholder involvement (as discussed in Section 2 and presented in Appendix D – Public and Stakeholder Outreach).

1.6 GOALS AND OBJECTIVES

The planning process included a review and update of the prior mitigation goals and objectives as a basis for the planning process and selection of appropriate mitigation actions addressing all hazards of concern. Further, the goal development process considered the mitigation goals expressed in the 2019 State of New Jersey HMP, as well as other relevant county and local planning documents, as discussed in Section 6 (Mitigation Strategy).

1.7 HAZARDS OF CONCERN

Passaic County and participating jurisdictions reviewed the hazards that caused measurable impacts based on events, losses, and information available since the development of the 2015 Passaic County HMP and the 2019 State of New Jersey HMP. A list of potential hazards of concern was reviewed by the Planning Partnership, and each was evaluated to identify the hazards of concern for the 2020 update planning process. The list was presented to each of the participating jurisdictions where they evaluated their risk and vulnerability from each hazard of concern. While the overall hazard rankings were calculated for the County and each participating jurisdiction, the specific hazard rankings displayed in each annex reflect jurisdictional input. The hazard risk rankings were used to focus and prioritize individual jurisdictional mitigation strategies.

1.8 PLAN INTEGRATION INTO OTHER PLANNING MECHANISMS

Plan integration is the process by which jurisdictions look at their existing planning framework and align efforts with the goal of building a safer, smarter, and more resilient community. It is specific to each community and depends on the vulnerability of the built environment. Community-wide plan integration supports risk reduction through various planning and development measures, both before and after a disaster. Plan integration involves a community's plans, policies, codes, and programs that guide development and the roles of people and government in implementing these capabilities. Successful integration occurs through collaboration among a diverse set of stakeholders in the community (FEMA 2015).

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies are integrated into local planning mechanisms and become an integral part of public activities and decision making. Within Passaic County, there are numerous existing plans and programs that support hazard risk management and reduction, and thus, it is critical that the 2020 HMP update integrates, coordinates with, and complements those mechanisms.

Section 5 (Capability Assessment) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9 (Jurisdictional Annexes), the County and each participating jurisdiction identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("existing integration"), and how they intend to promote this integration ("opportunities for future integration").

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 9 (Jurisdictional Annexes).

1.9 IMPLEMENTATION OF PRIOR AND EXISTING LOCAL HAZARD MITIGATION PLANS

Section 9 (Jurisdictional Annexes) of the plan present the status of the mitigation projects identified in the 2015 Passaic County HMP. Numerous projects and programs have been implemented that have reduced hazard vulnerability to assets in the planning area. The County and jurisdictional annexes, as well as plan maintenance

procedures in Section 7 (Plan Maintenance), were developed to encourage specific activities. Future actions include integrating hazard mitigation goals into Master Plan updates; reviewing the HMP during updates of codes, ordinances, zoning, and development; and ensuring a more thorough integration of hazard mitigation, with its related benefits into municipal operations, will be completed within the upcoming five-year planning period.

1.10 IMPLEMENTATION OF THE PLANNING PROCESS

The planning process and findings are required to be documented in local HMPs. To support the planning process in developing this HMP, Passaic County and the participating jurisdictions have accomplished the following:

- Developed a Steering Committee and countywide planning partnership with jurisdictions and stakeholders.
- Reviewed the 2015 Passaic County Hazard Mitigation Plan.
- Identified and reviewed those hazards that are of greatest concern to Passaic County and its jurisdictions (hazards of concern) to be included in the plan.
- Profiled the relevant hazards.
- Estimated the inventory at risk and potential losses associated with the relevant hazards.
- Reviewed and updated the hazard mitigation goals and objectives.
- Reviewed mitigation strategies identified in the 2015 Passaic County HMP.
- Developed new mitigation actions to address reduction of vulnerability of hazards of concern.
- Involved a wide range of stakeholders and the public in the plan process.
- Developed mitigation plan maintenance procedures to be executed after obtaining approval of the plan from NJOEM and FEMA.

As required by the DMA 2000, Passaic County and its participating jurisdictions have informed the public and provided opportunities for public comment and input. Numerous agencies and stakeholders were invited to participate in the planning process by providing input and expertise. Refer to Appendix D (Public and Stakeholder Outreach Documentation) for copies of public announcements, social media posts and other forms of public and stakeholder outreach conducted.

1.11 ADOPTION

Upon FEMA Approval Pending Adoption (APA) status of the 2020 HMP update, Passaic County and each municipality will adopt the plan by resolution of local governing body. An example resolution authorizing adoption of the 2020 Passaic County HMP may found in Appendix A. Upon receipt of the FEMA APA status, participants will adopt the plan and the resolutions saved in Appendix A. Please refer to Section 8 (Planning Partnership) for additional information on plan adoption procedures.

1.12 ORGANIZATION OF THE HAZARD MITIGATION PLAN

The Passaic County HMP update is organized as a two-volume plan. Volume I provides information on the overall planning process and hazard profiling and vulnerability assessments, which serves as a basis for understanding risk and identifying mitigation actions. As such, Volume I is intended for use as a resource for on-going mitigation analysis. Volume II provides an annex dedicated to each participating jurisdiction. Each annex summarizes the jurisdiction's legal, regulatory, and fiscal capabilities; identifies vulnerabilities to hazards; documents mitigation plan integration with other planning efforts; records status of past mitigation actions; and presents an individualized mitigation strategy. The annexes are intended to provide a useful resource for each jurisdiction for implementation of mitigation projects and future grant opportunities, as well as place for each jurisdiction to record and maintain their local aspect of the countywide plan.

Volume I of this HMP includes the following sections:

Section 1: Introduction: Overview of participants, planning process and information regarding adoption of the HMP by Passaic County and each participating jurisdiction.

Section 2: Planning Process: Description of the HMP methodology and development process; Steering Committee, Planning Committee, Planning Partnership, and stakeholder involvement efforts; and a description of how this HMP will be incorporated into existing programs.

Section 3: County Profile: Overview of Passaic County, including: (1) physical setting, (2) land use, (3) land use trends, (4) population and demographics, (5) general building stock and (6) critical facilities and lifelines.

Section 4: Risk Assessment: Documentation of the hazard identification and hazard risk ranking process, hazard profiles, and findings of the vulnerability assessment (estimates of the impact of hazard events on life, safety, health, general building stock, critical facilities, the economy); description of the status of local data; and planned steps to improve local data to support mitigation planning.

Section 5: Capability Assessment: A summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County.

Section 6: Mitigation Strategy: Information regarding the mitigation goals and objectives in response to priority hazards of concern and the process by which Passaic County and local mitigation strategies have been developed or updated.

Section 7: Plan Maintenance Procedures: System established to continue to monitor, evaluate, maintain, and update the HMP.

Volume II of this plan includes the following sections:

Section 8: Planning Partnership: Description of the planning partnership, their responsibilities, and description of jurisdictional annexes.

Section 9: Jurisdictional Annexes: Jurisdiction-specific annex for Passaic County and each participating jurisdiction containing their hazards of concern, hazard ranking, capability assessment, mitigation actions, action prioritization specific only to Passaic County or that jurisdiction, progress on prior mitigation activities (as applicable), and a discussion of prior local hazard mitigation plan integration into local planning processes.

Appendices include the following:

Appendix A: Plan Adoption: Resolutions from the County and each jurisdiction included as each formally adopts the HMP update.

Appendix B: Participation Documentation: Matrix to give a broad overview of who attended meetings and when input was provided to the HMP update, as well as Letters of Intent to Participate described in Section 2 (Planning Process), annex sign-off sheets discussed in Section 6 (Mitigation Strategy) and additional worksheets submitted during workshops conducted throughout the planning process.

Appendix C: Meeting Documentation: Agendas, attendance sheets, minutes, and other documentation (as available and applicable) of planning meetings convened during the development of the plan.

Appendix D: Public and Stakeholder Outreach Documentation: Documentation of the public and stakeholder outreach effort including webpages, informational materials, public and stakeholder meetings and presentations, surveys, and other methods used to receive and incorporate public and stakeholder comment and input to the plan process.

Appendix E: Risk Assessment Supplementary Data: Expanded explanation of community lifelines; critical facility storm surge exposure results by municipality; and the previous hazard events from the 2015 HMP.

Appendix F: Mitigation Strategy Supplementary Data: Documentation of the broad range of actions identified during the mitigation process; types of mitigation actions; the mitigation catalog developed using jurisdiction input and potential mitigation funding sources.

Appendix G: Plan Maintenance Tools: Examples of plan review tools and templates available to support annual plan review.

Appendix H: Linkage Procedures: Procedures for non-participating local governments to "link" to the plan within the period of performance to gain eligibility for programs under the DMA 2000.

1.13 THE UPDATED PLAN – WHAT IS DIFFERENT?

Both the planning process and the 2020 HMP have been enhanced for this update. An increased effort to actively engage stakeholders and the public was a focus of the update; as well as the continued education of the Planning Partnership of mitigation and available grant funding opportunities. The mitigation strategy was updated to only contain detailed actions that are considered priority to each jurisdiction (i.e., quality not quantity). Further, the sections in the 2020 HMP have been realigned to increase the readability of the plan. The following summarizes process and plan changes that differ from the 2015 process and HMP:

- Section 2 (Planning Process) was formerly Section 3 in the 2015 HMP and now comprises the Planning Process section of the plan. Adoption information has been re-located to Section 8 (Planning Partnership) and Appendix A.
- Section 2 (Planning Process) has been updated in its entirety to summarize the planning process followed for the 2020 HMP update.
    - The Steering Committee was expanded to include a representative from the Passaic County Department of Parks and a representative from the Borough of Woodland Park.
    - Expanded and targeted stakeholder outreach and engagement including meeting with the New Jersey Highlands Water Protection and Planning Council, and New Jersey Transportation Planning Authority (NJTPA).
    - Workshop-style meetings were held to further engage planning partners. These meetings were designed to inspire active engagement by attendees by updating large-scale maps, complete worksheets, and working in small groups to discuss common challenges/problems to focus the risk assessment and mitigation strategy updates.
    - Public engagement was enhanced to include but not limited to the following:
        - Multi-lingual brochure and social media posts (English and Spanish)
        - Presentation at already-scheduled public meetings (e.g., National Weather Service (NWS) SKYWARN Spotter training in September 2019; Borough of Pompton Lakes Flood Advisory Board meeting).
        - Interactive ‘voting’ exercise at meetings to survey preferred mitigation measures by residents.
- Section 4 (Risk Assessment) has been streamlined and updated as summarized below.

- A new hazard of concern, Infestation and Invasive Species, was added to the plan and the flood hazard was expanded to collect additional details on urban flooding (i.e., flooding outside of the floodplain).
- The updated plan is based on new inventory data (i.e., building footprints, updated replacement cost values, critical facilities and community lifelines) and updated spatial hazard data.
- The topic of FEMA lifelines is included. All jurisdictions identified critical facilities considered lifelines in accordance with FEMA's community lifeline definition.
- The flood hazard was expanded to include urban flooding or flooding outside of the floodplain. The Planning Partnership identified locations of urban flooding which was developed into a spatial layer to inform the mitigation strategy.
- The updated DFIRMs for Passaic County were used with a comparison between the previous and new effective maps.
- The hazard ranking methodology was expanded to include adaptive capacity and climate change.
- In addition to requesting recent and anticipated new development from each jurisdiction, the New Jersey Highlands Council Existing Community Zone (both in-fill of new development and re-development) and Designated Centers and the NJDEP Sewer Service Areas were evaluated.
- The NJTPA's Passaic River Basin Climate Study results were obtained and integrated into the risk assessment.

- Section 5 (Capability Assessment) and Section 9 (Jurisdictional Annexes) are subject to several changes of the capability assessment, both in Volumes I and II of the plan.
  - Section 5 (Capability Assessment) is now a stand-alone section for the capability assessment summarizing existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County. This information was formerly part of Section 6 (Mitigation Strategy) in the 2015 HMP.
  - Section 9 (Jurisdictional Annexes) has an expanded capability assessment to include additional planning mechanisms in New Jersey as well as information regarding plan integration in the Planning, Legal and Regulatory table.
- Section 6 (Mitigation Strategy) - A mitigation strategy workshop was conducted in February 2020 and supported by NJOEM to focus on the development of specific problem statements based on the impacts of natural hazards in the County and communities. These problem statements provided a detailed description of the problem area, including its impacts to the municipality/jurisdiction; past damages; loss of service; etc. An effort was made to include the property/project location, adjacent streets, water bodies, and well-known structures as well as a brief description of existing conditions (topography, terrain, hydrology) of the site. These problem statements form a bridge between the hazard risk assessment which quantifies impacts to each community with the development of actionable mitigation strategies.
- The jurisdictional annexes in Section 9 have been enhanced to include the following:
  - Identification of the NFIP Floodplain Administrator as part of the hazard mitigation planning team.
  - Expanded capability assessment including the identification of additional administrative and technical capabilities and catalog of adaptive capacity for each hazard of concern for each jurisdiction.
  - Inclusion of a table of jurisdiction-specific risk assessment results per hazard.
  - Expansion of the critical facility and lifeline flood hazard exposure table to include a mitigation action, if appropriate.
  - A user-friendly presentation of the hazard ranking results.
  - A revised 2015 previous mitigation strategy status table to more clearly identify if the action is to be included in the 2020 HMP update.
  - An increased focus on actionable projects has been applied; removing actions that are capabilities and focusing on high-ranked hazards.

  - A more detailed proposed mitigation action table that now specifies the problem statement and the proposed solution (mitigation action). The more detailed mitigation strategy is also reflected in the mitigation action worksheets that also include additional details.
  - A table that summarizes the actions across the ranked hazards and their mitigation action types.
  - Individuals that contributed to the annex are specifically listed at the end of the section.
  - Mitigation action worksheets have only been developed for FEMA-eligible projects, per NJOEM guidance.
- To increase public engagement, the following efforts were made:
  - Multi-lingual public outreach strategy (English and Spanish) to reach a broader audience in the County (informational materials, social media posts and translator at a public engagement event).
  - All Planning Partnership meetings were made open to the public.
  - Social media (Facebook and Twitter) was used to inform the public of meetings and to take the citizen survey.
  - Public events were attended to engage residents and survey the mitigation actions they would like implemented in the County.
- A grant-funding webinar was conducted to summarize the upcoming fiscal year 2019 FEMA Hazard Mitigation Assistance grant funding opportunity and how jurisdictions can leverage the HMP update and develop competitive applications and benefit-cost analyses. In addition, the planning consultant and NJOEM met with individual municipalities that expressed interest in applying to assist with identifying projects and providing guidance on the information needed to complete the grant application and BCA process.
- A user-friendly tone was used to cater to the strong desire for this plan to be understandable to the general public and not overly technical. This includes limiting the hazard profile section to brief summaries and providing an increased number of graphical summaries throughout the risk assessment.
- An enhanced mitigation strategy process was utilized to develop a robust and actional action plan.
  - A mitigation toolbox was built to assist with mitigation action identification.
  - Utilizing the risk assessment and capability assessment results, problem statements were drafted by each municipality and used to inform the mitigation action development.
  - Actions are identified, rather than strategies. Strategies provide direction, but actions are fundable under grant programs. The identified actions are designed to meet multiple measurable objectives, so that each planning partner can measure the effectiveness of their mitigation actions.
- The plan maintenance strategy is more clearly defined to provide a roadmap for the annual monitoring of the plan.

Table 1-3 summarizes the major changes between the two plans as they relate to 44 CFR planning requirements.

Table 1-3. HMP Changes Crosswalk

44 CFR Requirement	2015 HMP	2020 Updated HMP
Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate	The 2015 plan followed an outreach strategy utilizing multiple media developed and approved by the Steering Committee. This strategy involved the following: • Establishment of a plan informational website. • Press release • Use of public and stakeholder information surveys. Stakeholders were identified and coordinated with throughout the process. A comprehensive review of	Building upon the success of the 2015 plan, the 2020 planning effort deployed an enhanced public engagement methodology: • Multi-lingual informational materials and news release • Use of social media (Facebook and Twitter). • Web-deployed surveys to residents and targeted stakeholders • All meetings open to the public

44 CFR Requirement	2015 HMP	2020 Updated HMP
development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports and technical information.	relevant plans and programs was performed by the planning team.	• Resident voting exercise to identify mitigation action types preferred to be implemented • Attendance at public events to engage residents As with the 2015 plan, the 2020 planning process identified key stakeholders and coordinated with them throughout the process. A comprehensive review of relevant plans and programs was performed by the planning team.
§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	The 2015 plan included a comprehensive risk assessment of hazards of concern. Risk was defined as (probability x impact), where impact is the impact on people, property, and economy of the planning area. All planning partners ranked hazard risk as it pertains to their jurisdiction. The potential impacts of climate change are discussed for each hazard.	The same methodology, using new, updated data, was deployed for the 2020 plan update. The flood hazard was expanded to include urban flooding (or flooding outside of the floodplain). A new hazard of concern, infestation and invasive species was included. The hazard ranking methodology was expanded to include adaptive capacity and climate change. Jurisdiction-specific risk assessment results are summarized in Section 4 (Risk Assessment) and in each jurisdictional annex (Section 9).
§201.6(c)(2)(i): [The risk assessment] shall include a] description of the … location and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	The 2015 plan presented a risk assessment of each hazard of concern. Each section included the following: • Hazard profile, including maps of extent and location, previous occurrences, and probability of future events. • Climate change impacts on future probability. • Impact and vulnerability on life, health, safety, general building stock, critical facilities, and economy. • Future growth and development.	The same format, using new and updated data, was used for the 2020 plan update. Each section of the risk assessment includes the following: • Hazard profile, including maps of extent and location, previous occurrences, and probability of future events. • Climate change impacts on future probability using the best available data for New Jersey. • Newly available study from North Jersey Transportation Planning Authority (NJTPA) was used to inform the risk assessment. • Vulnerability assessment includes impact on life, safety, and health, general building stock, critical facilities/lifelines, and the economy, as well as future changes that could impact vulnerability (population, development and climate). • The vulnerability assessment also includes changes in vulnerability since the 2015 plan.
§201.6(c)(2)(ii): [The risk assessment] shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall	Vulnerability was assessed for all hazards of concern. The HAZUS-MH-MH computer model was used for the wind, earthquake, and flood hazards. These were Level 2 analyses using County data. Site-specific data on	A robust vulnerability assessment was conducted for the 2020 plan update, using new and updated asset and hazard data. Volume 1, Section 4.3 summarizes countywide and municipal-specific vulnerability for

44 CFR Requirement	2015 HMP	2020 Updated HMP
summary of each hazard and its impact on the community.	County-identified critical facilities were entered into the HAZUS-MH model. HAZUS-MH outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from HAZUS-MH-MH.	each hazard of concern. The jurisdictional annexes (Section 9) include a summary table of impacts on each community.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods.	A summary of NFIP insured properties including an analysis of repetitive loss property locations was included in the plan.	Updated NFIP statistics, as well as Write-Your-Own statistics were presented in the 2020 plan update using best available data.
Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). In addition, critical facilities considered lifelines in accordance with FEMA's definition were identified.
Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimates were generated for all hazards of concern. These were generated by HAZUS-MH-MH for the wind, earthquake, and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in HAZUS-MH.	Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). Estimated potential losses are reported in both Volume 1, Section 4.3 and Volume II Section 9 for each jurisdiction.
Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a summary of anticipated development in the County profile, as well as in each individual annex.	A spatial analysis using Highlands Council identified growth areas, and potential new development identified by municipalities was conducted to determine if located in hazard areas. These results were reported to all participants and summarized in their annexes to discuss mitigation measures. In Volume I, Section 4.3, projected changes in population and development are discussed in each hazard section and how these projected changes may lead to increased vulnerability, or plans/regulations/ordinances in place to implement mitigation to protect the development. Further, a land use analysis was conducted for the flood hazard to examine residential and non-residential classified land in the floodplain.
§201.6(c)(3):[The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.]	The 2015 plan contained goals, objectives and actions. Each planning partner identified actions that could be implemented within their capabilities. The actions were jurisdiction-specific and strove to meet multiple objectives. All objectives met multiple goals and stand alone as components of the plan.	The Steering Committee reviewed and updated the goals and objectives and they were approved by the Planning Committee. A mitigation strategy workshop with associated tools and guidance on problem statement development was deployed to inform the identification of

44 CFR Requirement	2015 HMP	2020 Updated HMP
	Each planning partner completed an assessment of its regulatory, technical, and financial capabilities.	mitigation actions. Actions that were completed or no longer considered to be feasible were removed; and actions considered general or capabilities were moved to the capability and integration sections. The balance of the actions was carried over to the 2020 plan, and in some cases, new actions were added to the action plan.
Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified goals, and objectives targeted specifically for this hazard mitigation plan. These planning components supported the actions identified in the plan.	The Steering Committee reviewed and updated the goals and objectives and they were approved by the Planning Committee. Several new objectives were identified to align with updated County and municipal priorities.
Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	The 2015 plan included mitigation action worksheets that evaluated alternative actions considered for the final mitigation strategy.	For the 2020 update, a mitigation catalog was developed to provide a comprehensive range of specific mitigation actions to be considered. A table with the analysis of mitigation actions by type and hazard was used in jurisdictional annexes to the plan. Mitigation action worksheets with an alternatives evaluation were prepared for FEMA-eligible projects.
Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	All municipal planning partners that participate in the National Flood Insurance Program indicated their commitment to maintain compliance and good standing under the program.	An analysis of repetitive and severe repetitive loss properties was conducted and is summarized in Section 4.3.7 (Flood) and in Section 9 (Jurisdictional Annexes). Municipalities with repetitive and severe repetitive loss properties included an action to mitigate those properties.
Requirement: §201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in section (c)(3)(ii) will be prioritized, implemented and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended action was prioritized using a revised methodology based on the STAPLEE criteria was used to prioritize projects.	A revised methodology based on the STAPLEE criteria and using new and updated data was used for the 2020 plan update. The 14 criteria were used to evaluate each potential mitigation action. The evaluation included a qualitative benefits and cost review. The results of the evaluation were used to identify the actions to include in the plan and assist with the prioritization. An emphasis was placed on benefits and costs (quantified where possible and listed in the mitigation action worksheets), as well as timeline for implementation (also documented in the mitigation action worksheets for FEMA-eligible projects).
Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	The 2015 plan outlined a detailed maintenance strategy.	The 2020 plan details a plan maintenance strategy similar to that of the initial plan. It has been enhanced to provide a roadmap for the annual monitoring of the plan and a program to assist with project progress reporting. This includes the

44 CFR Requirement	2015 HMP	2020 Updated HMP
		inclusion of a summary plan maintenance matrix that provides an overview of the planning partner responsibilities for monitoring, evaluation, and update of the plan.
Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	The 2015 plan details recommendations for incorporating the plan into other planning mechanisms.	The 2020 plan details recommendations for incorporating the plan into other planning mechanisms such as the following: • Master Plan • Emergency Response Plan • Capital Improvement Programs • Municipal Code
Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	The 2015 plan details a strategy for continuing public involvement.	The 2015 plan maintenance strategy was enhanced for the 2020 plan. In addition, the County will use a proprietary online tool to support the annual progress reporting of mitigation actions. Section 7 (Plan Maintenance) also details the continued public participation in the plan maintenance process.
Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).	Passaic County and all jurisdictions participated in the 2015 HMP.	The 2020 plan achieves DMA compliance for Passaic County and all jurisdictions. Resolutions for each partner adopting the plan can be found in Appendix A of this volume.

SECTION 2. PLANNING PROCESS

2020 HMP Changes

- The sections in the 2020 HMP were realigned to increase the readability of the plan. Section 2 (formerly Section 3 in the 2015 HMP) now comprises the Planning Process section of the plan.
- All aspects of the planning process were updated for the 2020 HMP.
- Public outreach was enhanced to reach a broader audience by using additional media outlets (Facebook, Twitter) and having multi-lingual materials (brochure, social media posts) available in English and Spanish.
- Workshop-style meetings were held with the Planning Partnership to engage participants, using small break-out groups and large-scale poster maps to convey hazard vulnerability and assist with hazard ranking updates.

2.1 INTRODUCTION

This section includes a description of the planning process used to update the 2015 Passaic County and All Municipalities Hazard Mitigation Plan (HMP), including how it was prepared, who was involved in the process, and how the public was involved. To ensure that the plan meets requirements of the DMA 2000 and that the planning process would have the broad and effective support of the participating jurisdictions, regional and local stakeholders, and the public, an approach to the planning process and plan documentation was developed to achieve the following goals:

- The HMP will be multi-jurisdictional and consider natural and human-caused hazards facing Passaic County, thereby satisfying the natural hazards mitigation planning requirements specified in the DMA 2000.

- Passaic County invited all municipalities in the County to join with them in the preparation of the Passaic County HMP. The County and all municipalities are participating in the HMP as indicated in Table 2-1 below.

- The HMP shall be developed following the process outlined by the DMA 2000, FEMA regulations, and prevailing FEMA and NJOEM guidance. Following this process ensures all the requirements are met and support HMP review.

Table 2-1. Participating Passaic County Jurisdictions

Boroughs	
Bloomingdale	Prospect Park
Haledon	Ringwood
Hawthorne	Totowa
North Haledon	Wanaque
Pompton Lakes	Woodland Park
Townships	**Cities**
Little Falls	Clifton
Wayne	Passaic
West Milford	Paterson
Passaic County	

The Passaic County HMP update was written using the best available information obtained from a wide variety of sources. Throughout the HMP update process, a concerted effort was made to gather information from local and regional agencies and staff, as well as stakeholders, federal and state agencies, and the residents of the County. The HMP Steering and Planning Committees, together called the Planning Partnership, solicited information from local agencies and individuals with specific knowledge of certain hazards and past historical events, as well as considering planning and zoning codes, ordinances, and other recent planning decisions. The hazard mitigation strategies identified in this HMP have been developed through an extensive planning process involving local, county and regional agencies, County residents and stakeholders.

This section describes the mitigation planning process, including (1) Organization of the Planning Process; (2) Stakeholder Outreach and Involvement; (3) Public Participation; (4) Integration of Existing Data, Plans, and Technical Information; (5) Integration with Existing Planning Mechanisms and Programs; and (6) Continued Public Involvement.

2.2 ORGANIZATION OF THE PLANNING PROCESS

Many parties supported the preparation of this HMP update: County officials, municipal officials, the Steering Committee, Planning Committee, stakeholders and planning consultant. This planning process does not represent the start of hazard risk management in the County; rather it is part of an ongoing process that various State, County and local agencies and individuals have continued to embrace. A summary of the past and ongoing mitigation efforts is provided in Section 6 (Mitigation Strategy), as well as in Volume II Section 9 (Jurisdictional Annexes), to give an historical perspective of the County and local activities implemented to reduce vulnerablity to hazards in the planning area.

This section of the HMP identifies how the planning process was organized with the many "planning partners" involved and outlines the major activities that were conducted in the development of this HMP update.

2.2.1 Organization of Planning Partnership

Recognizing the need to manage risk within the County, and to meet the requirements of the DMA 2000, the Passaic County OEM led the update to the 2015 Passaic County HMP. The State of New Jersey and Passaic County signed a Grantee-Subgrantee Agreement (PDMC-PL-02-NJ-2017-002) to fund the Passaic County HMP update. The period of performance for this grant is from August 14, 2017 and ending March 22, 2021. The County selected a contract planning consultant (Tetra Tech Inc. – Parsippany, NJ) to guide the County and participating jurisdictions through the HMP update process. A contract between Tetra Tech Inc. (Tetra Tech) and the County was executed in August 2019. Specifically, Tetra Tech, the "contract consultant", was tasked with:

- Assisting with the organization of a Steering Committee and Planning Committee.
- Assisting with the development and implementation of a public and stakeholder outreach program.
- Data collection.
- Facilitation and attendance at meetings (Steering Committee, Planning Committee, stakeholder, public and other).
- Review and update of the hazards of concern, and hazard profiling and risk assessment.
- Assistance with the review and update of mitigation planning goals and objectives.
- Assistance with the review of progress of past mitigation strategies.
- Assistance with the screening of mitigation actions and the identification of appropriate actions.
- Assistance with the prioritization of mitigation actions.
- Authoring of the draft and final HMP documents.

In August 2019, Passaic County OEM notified all municipalities within the County of the pending planning process and invited them to formally participate. Municipalities were provided with a copy of the Planning Partner Expectations and asked to formally notify the County of their intent to participate [via a Letter of Intent to Participate (LOIP)] and to identify a primary and secondary planning point of contact to serve on a Planning Committee and represent the interests of their respective community. In addition, each municipal Floodplain Administrator (FPA) was identified in the LOIP and requested to actively participate in the planning process. Section 9 (Jurisdictional Annexes) and Appendix B (Participation Documentation) detail contributions provided by the FPA. All jurisdictions returned their LOIP; refer to Appendix B for copies of their LOIPs.

To facilitate HMP development, with support from their contract planning consultant, Passaic County developed a Steering Committee to provide guidance and direction to the planning effort, and to ensure the resulting document will be embraced both politically and by the constituency within the planning area. All municipalities participating in the plan update authorized the Steering Committee to perform certain activities on their behalf, via the LOIP. Specifically, the Steering Committee was charged with:

Steering Committee (SC) *is comprised of County and municipal representatives and stakeholders that guide and lead the HMP update process on behalf of the Planning Partnership.*

Planning Committee (PC) *is comprised of representatives from each participating jurisdiction (County and municipal).*

Planning Partnership = SC + PC

- Providing guidance and overseeing the planning process on behalf of the general planning partnership.
- Attending and participating in Steering Committee meetings.
- Establish a timeline for completion of the plan;
- Assisting with the development and completion of certain planning elements, including:
  - Reviewing and updating the hazards of concern,
  - Developing a public and stakeholder outreach program,
  - Assuring that the data and information used in the plan update process is the best available
  - Reviewing and updating the hazard mitigation goals and objectives,
  - Identification and screening of appropriate mitigation strategies and activities; and
  - Reviewing and commenting on plan documents prior to submission to NJOEM and FEMA.
  - Ensure that the plan meets the requirements of DMA 2000 and FEMA and NJOEM guidance.

The organizational structure was successfully implemented for the 2020 HMP updated consistent with the development of the initial 2015 planning process; new Steering Committee members include representatives from the Passaic County Department of Parks and Woodland Park (see Table 2-2). The Steering Committee provided guidance and leadership, oversight of the planning process, and acted as the point of contact for all participating jurisdictions and the various interest groups in the planning area.

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
Passaic County	Robert A. Lyons	Director, County OEM	X	X		
	Maryann Trommelen	Deputy OEM Coordinator	X		X	
	Fred Batelli	Deputy OEM Coordinator	X			
	Maria Dombayci	Deputy OEM Coordinator	X			

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
	Mike Lysicatos	Director, Department of Planning and Economic Development	X			
	Kenneth A. Simpson	Supervisor, Road Department	X			
	Jonathan Pera	County Engineer, Department of Engineering	X			
	Darryl Sparta	Director, Parks and Recreation	X			
	George Galbraith	Superintendent of Public Works, Stormwater Coordinator, Director of Emergency Preparedness, Borough of Woodland Park	X			
Borough of Bloomingdale	Jonathan Dunleavy	Mayor		X		
	Mike Hudson	OEM Coordinator			X	
	Thomas Boorady	Borough Engineer				X
City of Clifton	Angelina Tirado	OEM Coordinator, Fire Department		X		
	Michael Onder	Deputy OEM Coordinator			X	
	Ernie Tedesco	Construction Official				X
Borough of Haledon	Mounir Almaita	OEM Coordinator		X		
	Lt. George Guzman	Deputy OEM Coordinator			X	
	Phil Cheff	Construction Official				X
Borough of Hawthorne	Richard M. McAuliffe	OEM Coordinator		X		
	Brian Vanderhook	Deputy OEM Coordinator			X	
	Richard Stewen	Building Official				X
Township of Little Falls	James DiMaria	Construction Official		X		X
	Daniel D. Gianduso	OEM Coordinator			X	
Borough of North Haledon	Todd Darby	Assistant Chief, OEM Coordinator		X		
	Anthony Conforti	Lt., Deputy OEM Coordinator			X	
	Phil Cheff	Construction Official				X
City of Passaic	Walter Porto	Deputy OEM Coordinator		X		
	Captain Piyush Patel	Captain Piyush Patel, Police Department			X	
	Dennis Harrington	City Engineer				X
City of Paterson	Gabriel Aboyoun	OEM Coordinator		X		
	Fredrick Margron	City Engineer			X	
	Jerry Lobozzo	Construction Official				X
	Albert Evangelista	OEM Coordinator		X		

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
Pompton Lakes	Kevin R. Boyle	Administrator			X	
	Sal Poli	Construction Official				X
Borough of Prospect Park	Ariosto Rodriguez	OEM Coordinator		X		
	Yeisy Reyes	Deputy OEM Coordinator			X	
	Kevin Valt	Department Public Works Supervisor				X
Borough of Ringwood	Scott Heck	Borough Manager, Director of Department of Public Works, NFIP PFA		X		X
	Pat Murray, Jr.	OEM Coordinator			X	
Borough of Totowa	Rich Schopperth	Fire Official		X		
	Joseph Wassel	Municipal Clerk			X	
	Allan Burghardt	Construction Official				X
Borough of Wanaque	Angelo Calabro	OEM Coordinator		X		
	Edward Schroeder	Deputy OEM Coordinator			X	
	Michael Cristaldi	Borough Engineer				X
Township of Wayne	Dan Daly	OEM Coordinator		X		
	Neal Bellet	Business Administrator			X	
	Heather Vitz-Del Rio	Township Engineer, Director of Public Works and Engineering				X
Township of West Milford	Michael Moscatello	Deputy OEM Coordinator		X		
	Ed Steines	OEM Coordinator and Department of Public Works Director			X	
	James Lupo	Zoning Officer				X
Borough of Woodland Park	George Galbraith	Superintendent of Public Works, Stormwater Coordinator, Director of Emergency Preparedness	X	X		
	Kevin Galland	Administrator and Municipal Clerk			X	
	Allan Burghardt	Construction Code Official / Building Subcode Official / Building Inspector / Code Enforcement Officer				X

Notes: POC = Point of Contact; NFIP FPA=National Flood Insurance Program Floodplain Administrator

Each municipality received a copy of the "Planning Partner Expectations" which outlined the responsibilities of the participants and the agreement of the partners to authorize the Steering Committee to represent the jurisdiction in the completion of certain planning elements. Please note that while Steering Committee members are also part of the overall project Planning Partnership fulfilling these responsibilities on behalf of Passaic County. The Planning Partnership was collectively charged with the following:

- Represent their jurisdiction throughout the planning process.
- Assure participation of all department and functions within their jurisdiction that have a stake in mitigation (e.g., planning, engineering, code enforcement, police and emergency services, public works).
- Assist in gathering information for inclusion in the HMP update, including the use of previously developed reports and data.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Solicit and encourage the participation of regional agencies, a range of stakeholders, and citizens in the plan development process;
- Report on progress of mitigation actions identified in prior or existing HMPs, as applicable.
- Report on progress of integration of prior or existing HMPs into other planning processes and municipal operations.
- Identify, develop, and prioritize appropriate mitigation initiatives.
- Support and develop a jurisdictional annex for their jurisdiction.
- Develop and author the jurisdictional annex for their jurisdiction;
- Review, amend, and approve all sections of the plan update.
- Adopt, implement, and maintain the plan update.

The jurisdictional LOIP identifies the above "Planning Partner Expectations" as serving to identify those activities comprising overall participation by jurisdictions throughout the planning process. The jurisdictions in Passaic County have differing levels of capabilities and resources available to apply to the plan update process, and further have differing exposure and vulnerability to the hazard risks being considered in this plan. Passaic County's intent was to encourage participation by all-inclusive jurisdictions, and to accommodate their specific needs and limitations while still meeting the intents and purpose of plan participation. Such accommodations have included the establishment of a Steering Committee and engaging a contract consultant to assume certain elements of the planning process on behalf of the jurisdictions, and to provide additional and alternative mechanisms to meet the purposes and intent of mitigation planning.

Ultimately, jurisdictional participation is evidenced by a completed annex (chapter) of the HMP (Section 9) wherein the jurisdictions have identified their planning points of contact, evaluated their risk to the hazards of concern, identified their capabilities to effect mitigation in their community, and identified and prioritized an appropriate suite of mitigation initiatives, actions, and projects to mitigate their natural hazard risk; and eventually by the adoption of the updated plan via resolution.

Appendix B (Participation Documentation) identifies those individuals who represented their jurisdictions during this planning effort and indicates how they contributed to the planning process. This matrix is intended to give a broad overview of who attended meetings and when input was provided. All participants were encouraged to attend the Kick-off Meeting, Risk Assessment and Mitigation Action Workshop. During the planning process the planning consultant contacted each participant to offer support, explain the process, meet individually to collect updated information and to facilitate the submittal and review of critical documents.

All municipalities actively participate in the National Flood Insurance Program (NFIP) and have designated NFIP Floodplain Administrators (FPA). The FPAs were informed of the planning process, were provided the opportunity to review the plan including the jurisdictional annex and provide direct input to the plan update. Local FPAs are identified in the Points of Contact and Administrative and Technical portions of the jurisdictional annexes in Section 9 (Jurisdictional Annexes).

2.2.2 Planning Activities

Members of the Planning Partnership (individually and as a whole), as well as key stakeholders, convened and/or communicated regularly to share information and participate in workshops to identify hazards; assess risks; review existing inventories of and identify new critical facilities; assist in updating and developing new mitigation goals and strategies; and provide continuity through the process to ensure that natural hazards vulnerability information and appropriate mitigation strategies were incorporated. All members of the Steering Committee and Planning Partnership had the opportunity to review the draft plan and supported interaction with other stakeholders and assisted with public involvement efforts.

A summary of committee meetings (Steering Committee and Planning Partnership) held and key milestones met during the development of the HMP update is included in Table 2-3 that also identifies which DMA 2000 requirements the activities satisfy. Documentation of meetings (e.g., agendas, sign-in sheets, meeting notes) are in Appendix C (Meeting Documentation). Table 2-3 identifies only the formal meetings held during plan development but does not reflect all planning activities conducted by individuals and groups throughout the planning process. In addition to these meetings, each jurisdiction had several individual meetings (both in person and via teleconference) to work on their jurisdictional annexes (Section 9). Further, there was a great deal of communication between the County, committee members, and the contract consultant through individual local meetings, electronic mail (email), and by phone.

After completion of the HMP update, implementation and ongoing maintenance will become a function of the Planning Partnership as described in Section 7 (Plan Maintenance). The Planning Partnership is responsible for reviewing the HMP and soliciting and considering public comment as part of the five-year mitigation plan update.

Table 2-3. Summary of Mitigation Planning Activities / Efforts

Date	DMA 2000 Requirement	Description of Activity	Participants
August 1, 2019	N/A	Pre-Kick Off Meeting with County	PCOEM and Tetra Tech
August 15, 2019	1b, 2, 3a, 4a	Steering Committee Meeting #1: Review of mitigation and the 2015 HMP; Review of Steering Committee guidelines; Project schedule and data request; Hazards of concern review and updated; Stakeholders identified; Outreach was discussed (social media, website, brochures); Review of goals and objectives.	See Appendix C
August 29, 2019	1b, 2, 3a, 3c	Meeting #1 with New Jersey Transportation Planning Authority (NJTPA) to discuss the Passaic River Basin Climate Resilience Planning Study	NJTPA and Tetra Tech
September 2019	2	A news release was issued, and social media posts released (Facebook and Twitter) regarding the commencement of the HMP update, announcing the first public kickoff meeting in October. The HMP project website was updated with the multi-lingual brochure and citizen survey.	See Appendix D
September 24, 2019	1b, 2	Presented the HMP update at the National Weather Service SKYWARN Storm Spotter public meeting	PCOEM and Tetra Tech, See Appendix C
September 26, 2019	2, 4b	FEMA Pre-Disaster Mitigation and Flood Mitigation Assistance Grant Funding Webinar	Webinar offered to all plan participants
September 26, 2019	1b, 2	PCOEM presented the HMP update, planning participation requirements and the schedule at the Local Emergency Planning Committee (LEPC) meeting	See Appendix C
October 4, 2019	1b, 2, 3	Meeting #2 with New Jersey Transportation Planning Authority (NJTPA) to discuss the exchange data generated for the Passaic River Basin Climate Resilience Planning Study and integration into the HMP	NJTPA and Tetra Tech
October 10, 2019	1b, 2, 3a-c, 3e, 4a, 4b	Planning Partnership Kickoff Meeting – *open to the public:* Importance of mitigation and HMP; Participation Requirements; Review of Steering Committee decisions on August 15; Hazards of concern identification and previous events exercise; Distribution of multi-lingual brochure materials.	See Appendix C
December 10 2019	1b, 2, 3a, 4a	Steering Committee #2: Project status update; Linkage procedures; Hazard ranking methodology; County hazard ranking; SWOO exercise.	See Appendix C
January 23, 2020	1b, 2, 3a, 3b, 3c, 3d, 3e	Planning Partnership Risk Assessment Meeting – *open to the public*. Presentation of draft risk assessment results, hazard ranking exercise, SWOO exercise for high-ranked hazards, introduction to development of problem statements.	See Appendix C
February 20, 2020	1b, 2, 4a, 4b, 4c	Planning Partnership Mitigation Strategy Workshop – *open to the public* Review of FEMA and State mitigation strategy requirements; Problem statement development; Mitigation resources distributed including mitigation catalog and critical facility/lifeline risk assessment results; Review of Mitigation Action Worksheets; Small group breakouts to update mitigation strategy.	See Appendix C

Date	DMA 2000 Requirement	Description of Activity	Participants
February 27, 2020	1b, 2	Public Information Meeting hosted by the Pompton Lakes Flood Advisory Board. The HMP update was discussed and the citizen survey shared.	See Appendix D
April 2020	1b, 2	Passaic County distributed stakeholder surveys to collect vulnerabilities, capabilities and mitigation actions from academia, emergency services, transportation sector, utilities, hospital and health care, business/commerce and social services.	See Section 2.3 (Stakeholder Outreach and Involvement) and Appendix D
October 2019 – June 2020	2, 3, 4	Individual annex support meetings via in-person or virtual (teleconference)	See Appendix C
June 1, 2020	1b, 2, 3, 4	Meeting with the New Jersey Highlands Council to discuss capabilities, vulnerabilities and mitigation actions. In addition, areas of potential growth in the County as well as grant funding were discussed and captured in the plan.	New Jersey Highlands Council and Tetra Tech
June 8 to June 26, 2020	2, 3, 4	Steering Committee reviewed the draft HMP and considered stakeholder comments received to date	Steering Committee
June 29, 2020	2	Draft HMP posted to public project website All plan participants were notified and asked to assist with the public outreach including social media. Letters to neighboring Counties and stakeholders, including New Jersey Highlands Council, were distributed,	Public and Stakeholders
August 7, 2020	4b, 4c, 5b	All jurisdictions consider public and stakeholder comments received; update the plan accordingly	All plan participants
August 14, 2020	2	HMP submitted to NJOEM and FEMA Region II	NJOEM, FEMA Region II
Upon plan approval by FEMA	1a	Plan adoption by resolution by the governing bodies of all participating municipalities	All plan participants

Note: Each number in column 2 identifies specific DMA 2000 requirements, as follows:
1a – Prerequisite – Adoption by the Local Governing Body
1b – Public Participation
2 – Planning Process – Documentation of the Planning Process
3a – Risk Assessment – Identifying Hazards
3b – Risk Assessment – Profiling Hazard Events
3c – Risk Assessment – Assessing Vulnerability: Identifying Assets
3d – Risk Assessment – Assessing Vulnerability: Estimating Potential Losses
3e – Risk Assessment – Assessing Vulnerability: Analyzing Development Trends
4a – Mitigation Strategy – Local Hazard Mitigation Goals
4b – Mitigation Strategy – Identification and Analysis of Mitigation Measures
4c – Mitigation Strategy – Implementation of Mitigation Measures
5a – Plan Maintenance Procedures – Monitoring, Evaluating, and Updating the Plan
5b – Plan Maintenance Procedures – Implementation through Existing Programs
5c – Plan Maintenance Procedures – Continued Public Involvement

2.3 STAKEHOLDER OUTREACH AND INVOLVEMENT

Stakeholders are the individuals, agencies, and jurisdictions that have a vested interest in the recommendations of the HMP, including all planning partners. Diligent efforts were made to assure broad regional, county and local representation in this planning process. To that end, a comprehensive list of stakeholders was developed with the support of the Planning Partnership. Stakeholder outreach was performed early on, and continually throughout the planning process. This HMP update includes information and input provided by these stakeholders where appropriate, as identified in the references.

This subsection discusses the various stakeholders that were invited to participate in the development of this HMP update, and how these stakeholders participated and contributed. This summary listing cannot possibly represent the total of stakeholders that were aware of and/or contributed to this HMP update, as outreach efforts were being made, both formally and informally, throughout the process by the many planning partners involved in the effort, and documentation of all such efforts is impossible. Instead, this summary is intended to demonstrate the scope and breadth of the stakeholder outreach efforts made during the plan update process:

- All Planning Partnership meetings were open to the public and advertised via the Passaic County's website and social media platforms.
- Attended public events already scheduled and presented the plan and encouraged resident participation:
  - National Weather Service SKYWARN Spotter training attended by residents of Passaic and Bergen Counties
  - Pompton Lakes Flood Advisory Board meeting
- Municipalities distributed printed brochures in English and Spanish
- Distributed a stakeholder survey to provide input regarding vulnerabilities, capabilities and mitigation projects.
- Posted draft plan on the Passaic County OEM mitigation website and advertised using social media in Spanish and English.
- Distributed letters to regional stakeholders and neighboring counties to review the draft HMP.

Federal Agencies

Please see Appendix B (Participation Documentation) for further details regarding federal agency participation. All responses to the stakeholder surveys may be found in Appendix D (Public and Stakeholder Outreach).

FEMA Region II: Provided updated planning guidance; provided summary and detailed NFIP data for planning area; conducted plan review.

Information regarding hazard identification and the risk assessment for this plan update were requested and received or incorporated by reference from the following agencies and organizations:

- National Climatic Data Center (NCDC)
- National Hurricane Center (NHC)
- National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service (NWS)
- Storm Prediction Center (SPC)
- U.S. Army Corps of Engineers (USACE)
- U.S. Census Bureau
- U.S. Department of Agriculture (USDA)
- U.S. Department of Health and Human Services
- U.S. Environmental Protection Agency (USEPA)
- U.S. Geological Survey (USGS)

State Agencies

New Jersey State Police Office of Emergency Management (NJOEM): Administered the planning grant; provided updated planning guidance; attended the October 2019 Kickoff Meeting, January 2020 Risk Assessment Meeting, and February 2020 Mitigation Strategy Workshop; worked with local jurisdictions in

developing their updated mitigation strategy; consulted with individual municipalities interested in applying for 2019 FEMA Hazard Mitigation Assistance grants; and provided review of the draft HMP update.

New Jersey Department of Environmental Protection (NJDEP): The NJDEP was requested information regarding dams in Passaic County; provided the Community Assistance Visit dates and associated NFIP information for all jurisdictions. In addition, the Bureau of Dam Safety was asked to take the stakeholder survey.

Please see Appendix B (Participation Documentation) for further details regarding state agency participation. All responses to the surveys may be found in Appendix D (Public and Stakeholder Outreach).

County and Regional Agencies and Commissions and Non-Profits

County

Several County departments were represented on the Steering Committee, and additional departments and divisions actively involved in the HMP update planning process; refer to Table 2-2 and Appendices C and D. Passaic County Freeholder Mr. Bruce James attended the January 2020 Risk Assessment Planning Partnership meeting. As previously noted, Steering Committee members were invited to all meetings, were provided updates via email communication and invited to review the draft HMP. In addition, the following County employees were emailed an announcement regarding the HMP commencement and invited to participate in the citizen survey; refer to Appendix D (Public and Stakeholder Participation).

- Passaic County Board of Chosen Freeholders
- Passaic County Administrator
- Passaic County Planning Board through representation by the Director of Planning and Economic Development and County Engineer
- Passaic County Director of Parks and Recreation
- Passaic County Finance Director
- Passaic County Fire Coordinator
- Passaic County Engineer
- Passaic County Health Officer
- Passaic County EMS Coordinator
- Passaic County Supervisor of Roads
- Passaic County Sheriff's Department Liaison
- Passaic County Utilities Authority
- Passaic County Improvement Authority
- Director - Passaic County Para Transit
- Director – Preakness Healthcare Center
- Director – Passaic County Senior Services
- Director – Passaic County Animal Response Team
- Veterinarian – Passaic County Animal Response Team

Regional and Local Stakeholders

All Planning Partnership meetings were announced on the Passaic County HMP project website and posted on social media in English and Spanish to invite residents and stakeholders including the following sectors as outlined below. In addition, the County and municipal representatives emailed regional and local stakeholders requesting their participation in stakeholder sector-specific surveys to provide input on vulnerable assets, capabilities, and current/potential future mitigation projects; and invited to provide input on the draft HMP. Due to the current COVID-19 pandemic, questions were included that specifically targeted gaps/challenges faced from March to June 2020 in an effort to obtain additional feedback for the disease outbreak hazard and updated

mitigation strategy. Refer to Appendix C (Participation Documentation) for further details regarding regional and local stakeholder agency attendance at meetings and Appendix D (Public and Stakeholder Outreach) for additional details on the public and stakeholder outreach, including responses received to the surveys.

Emergency Services

The HMP commencement was discussed at the September 2019 Local Emergency Planning Committee (LEPC) meeting. In addition, numerous Municipal OEM Coordinators participated as points of contact for municipalities and contributed to the plan. Emergency services stakeholders were contacted directly by Passaic County and participating municipalities to take a stakeholder survey which included capabilities, vulnerabilities and mitigation projects/actions specific to agencies that provide emergency services. Overall, 31 responses were received on this survey as summarized in Appendix D. The surveys were distributed to the following:

- Municipal OEM Coordinators
- All EMS agencies in Passaic County
- The President of the Passaic County Police Chiefs Association distributed the survey to all Chiefs of Police in Passaic County
- Passaic County Fire Coordinator
- Passaic County EMS Coordinator
- Passaic County Sheriff's Department

Health and Social Services

The following hospital, health care and social service providers were contacted directly by Passaic County and participating municipalities to take a stakeholder survey which included the identification of specific mitigation actions/projects. In addition, municipalities were asked to distribute these custom surveys to establishments in their jurisdictions.

- Passaic County Health Officer
- American Red Cross
- Passaic County Senior Services
- Passaic County Preakness Healthcare Center – responded to the stakeholder survey
- Passaic County Animal Response Team (CART)
- Salvation Army
- St. Joseph's Hospital

Utilities

The following stakeholders were contacted directly to take a stakeholder survey that was customized for the utility sector. Questions included opportunities to share vulnerabilities, mitigation projects, as well as needs/gaps as a result of the COVD-19 pandemic. No survey responses were received as of August 7, 2020.

- New Jersey Board of Public Utilities
- PSE&G
- JCP&L
- Verizon
- Passaic Valley Water Commission
- Passaic Valley Sewerage Commission
- North Jersey District Waters Commission

Business Commerce

The Director of the Passaic County Division of Economic Development reached out directly to all Chambers of Commerce in the County to take a stakeholder survey customized for the business/commerce sector. In addition, the Passaic County Division of Economic Development sent out an email blast to 3,500 business contacts in the County to advertise the business/commerce survey. A condensed version of this list is included in Appendix D. The distribution list not only includes major business establishments and employers in Passaic County, but representatives across all sectors at federal, state and regional levels. Further, all municipalities were asked to distribute this survey to their local chambers of commerce and large employers. In summary, 13 responses were received on this survey; refer to Appendix D.

Transportation

Representatives at the following transportation and public works agencies were emailed directly and asked to take the transportation survey to provide input on capabilities, vulnerabilities and mitigation strategies. In addition, municipalities were asked to distribute this survey to their public works departments. No responses were received as of August 7, 2020.

- New Jersey Department of Transportation
- New Jersey Transit
- North Jersey Transportation Planning Authority
- Passaic County Para Transit

Academia

The following academic institutions were asked to take a stakeholder survey customized for academia. In addition, all municipalities were asked to distribute this survey to their local school districts. No responses were received as of August 7, 2020.

- Rutgers University
    - Office of the State Climatologist
    - School of Planning and Public Policy
    - Climate Institute
    - Cooperative Extension Water Resources Program
- Passaic County Community College
- Passaic County Technical and Vocational High School
- William Paterson University

Regional Agencies and Neighboring Counties

A meeting was held with the New Jersey Highlands Council to discuss the current planning in Passaic County, the funding availability and potential growth areas in the Highlands Region. Their capabilities related to hazard mitigation are summarized in Section 5 (Capability Assessment). Further, each annex summarizes planning conducted with the Highlands as well as if the community is located in the Preservation or Planning Area. The New Jersey Highlands Council also responded to the stakeholder survey and indicated they would be able to review the draft HMP when available.

The following regional agencies and neighboring counties were asked to take a stakeholder survey. In addition, Passaic County sent letters to each of the County OEM departments as well as the County Administrators. Additional participation is noted below:

- New Jersey Highlands Council
- Pompton Lakes Flood Advisory Council

- Sustainable Jersey
- New Jersey Future
- Morris County, New Jersey
- Warren County, New Jersey
- Sussex County, New Jersey
- Essex County, New Jersey
- Orange County, New York
- Rockland County, New York

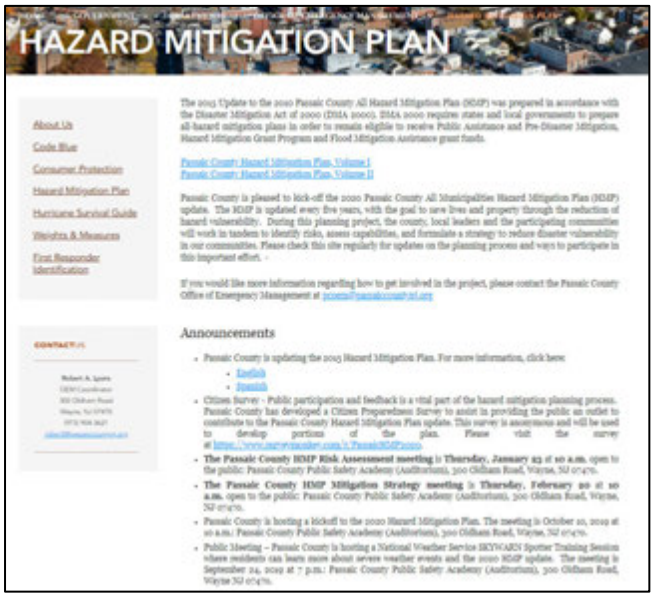
2.4 PUBLIC PARTICIPATION - CITIZEN INVOLVEMENT

In order to facilitate better coordination and communication between the Planning Partnership and citizens and to involve the public in the planning process, it was determined that meeting dates/locations will be made available to the public via the Passaic County OEM website dedicated to the HMP update and social media; and the draft HMP available on the Passaic County website. The participating partners also feel that community input on the HMP will increase the likelihood of hazard mitigation becoming one of the standard considerations in the evolution and growth of the County.

The Planning Partnership has made the following efforts toward public participation in the development and review of the HMP:

- The Passaic County OEM created a dedicated website for this project. The website went live in August 2019 and was continuously updated throughout the planning process. The public website contains a project overview, meeting announcements, a multi-lingual brochure, draft documents for review and comment, and a link to the citizens and stakeholder surveys; refer to Figure 2-1 for a screenshot of the public website and brochure.

Figure 2-1. Screenshots of the Multi-Lingual Brochure and Website for the 2020 HMP Update



- All hazard mitigation Planning Partnership meetings were open to the public and advertised on the Passaic County HMP website and through social media (Facebook and Twitter). The citizen survey was available through the website and social media as well; refer to Figure 2-2 for an example post. Additional examples of County and municipal outreach are presented in Appendix D.

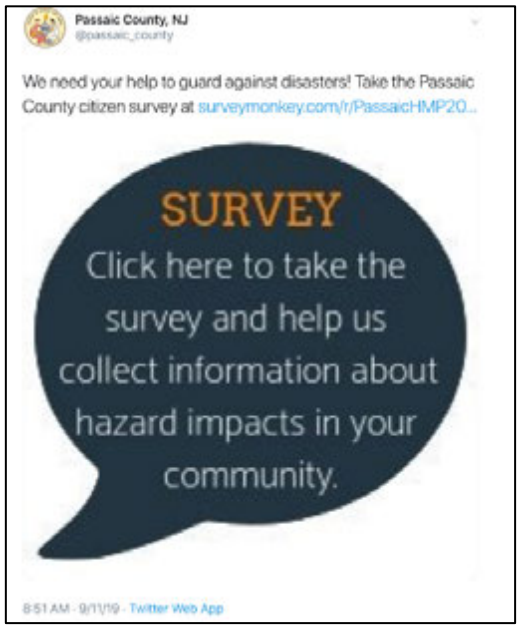


Figure 2-2. Example Social Media Post to Advertise the Resident Survey

- The Passaic County issued an official News Release that announced the commencement of the HMP update and invited the public to attend the kickoff meeting and take the citizen survey. This News Release was also posted on the County website; refer to Appendix D for a copy.

- An on-line natural hazards preparedness citizen survey was developed to gauge household preparedness that may impact the County and to assess the level of knowledge of tools and techniques to assist in reducing risk and loss of those hazards. The questionnaire asked quantifiable questions about citizen perception of risk, knowledge of mitigation, and support of community programs. The questionnaire also asked several demographic questions to help analyze trends. The questionnaire has been available on the public website since September 2019, and further advertised on additional County and municipal websites and on printed materials in English and Spanish. Reponses were collected and shared with the Planning Partnership at the January 2020 and February 2020 meetings to inform problem statement development and mitigation action development. As of June 2020, 79 residents responded to the survey. Appendix D summarizes public input received through the website, the online survey, and other sources.

- A hazard mitigation planning brochure was developed to inform the public of the planning process, provide local contact information, and encourage the public to review the plan and provide input. This brochure was provided to all plan participants in electronic and hard copy format to distribute in their offices and communities; refer to Figure 2-1 and Appendix D. The brochure was made available in English and Spanish.

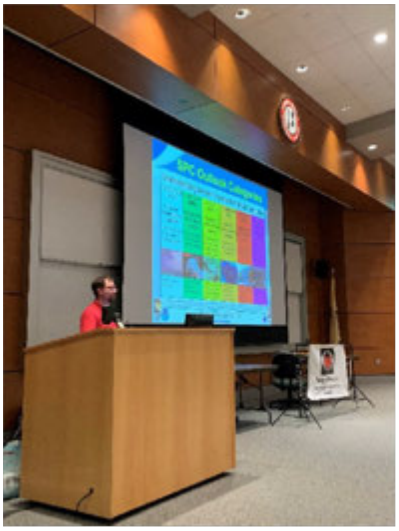
- Passaic County OEM and the planning consultant attended the National Weather Service (NWS) SKYWARN Spotter training in September 2019 hosted at the Passaic County Community College Public Safety Academy. This training is open to the public and advertised on the NWS website as well as by the County. Over 50 residents from Passaic, Bergen and Essex Counties in New Jersey, and Rockland County New York were in attendance. Hard copies of the HMP brochure were distributed. At the beginning of the training, the HMP update was presented and information provided regarding the upcoming meetings and citizen survey. Several questions were asked by attendees, including residents from neighboring counties inquiring about their HMP update.

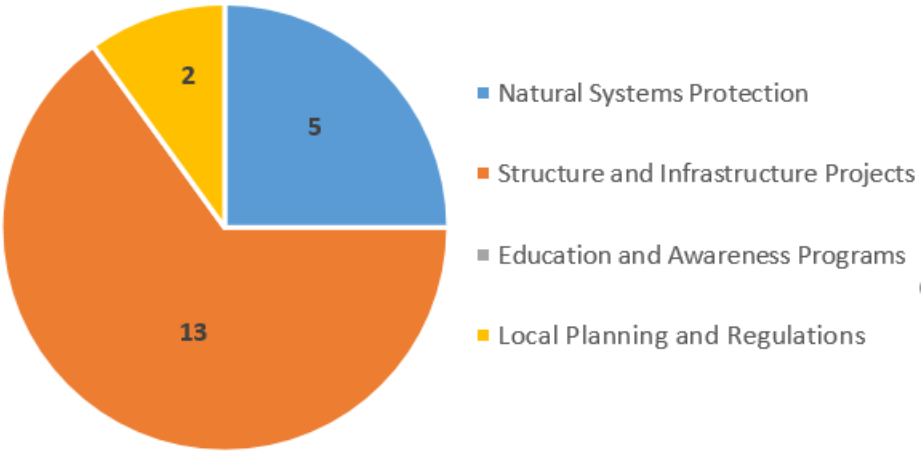
The HMP was presented at the September 2019 National Weather Service SKYWARN Spotter training at the Passaic County Community College Public Safety Academy, open to the public, in which residents from several counties were in attendance:

1. *Passaic County, NJ*
2. *Bergen County, NJ*
3. *Essex County, NJ*
4. *Rockland County, NY*

In addition, attendees were asked to 'vote' on their preferred mitigation projects to be implemented in Passaic County. Twenty (20) residents stopped by the mitigation table and participated in the survey selecting their preferred mitigation project type to reduce natural hazard risk. Overall, the majority of attendees selected structure and infrastructure mitigation projects. Refer to Figure 2-3 for pictures of the meeting and the survey results.

Figure 2-3. SKYWARN Spotter Training





- A public meeting was held in the Borough of Pompton Lakes hosted by the Flood Advisory Board. Numerous residents attended with standing-room only available. The HMP was presented and citizen survey distributed to meeting attendees as well as a discussion regarding the change in the flood maps; refer to Figure 2-4.

- The HMP was scheduled to be on the agenda at the Emergency Awareness Seminar in the Borough of Pompton Lakes on March 18, 2020. Unfortunately, this event was canceled due to the COVID-19 pandemic.

- The Passaic County Camp Hope Commission engages seniors and the youth in the County. An event scheduled on May 8, 2020 was canceled due to the COVID-19 pandemic. The HMP planning consultant was scheduled to speak at this event to engage residents further in the planning process, discuss vulnerabilities and have an interactive mitigation action voting exercise to gather further input on preferred mitigation options in the County.

- Passaic County residents were provided an opportunity to comment on the draft HMP before submittal to FEMA. The HMP was posted on the HMP public website on June 29, 2020 for review. All jurisdictions were requested to assist with advertising the plan was poste d via their websites and social media. Public comments received through July 29, 2020 were distributed to Planning Partnership for their consideration.

Figure 2-4. Public Flood Advisory Board Meeting in the Borough of Pompton Lakes

Figure 2-5. Emergency Awareness Seminar in Pompton Lakes

The New Jersey Highlands Water Protection and Planning Council (Highlands Council) provided a letter to Passaic County OEM after their review of the draft HMP. The letter indicated the HMP is comprehensive and incorporates many of the issues of concern to the Highlands Council, evaluates risk appropriately and provides a variety of mitigation strategies. The Highlands Council was pleased to see stormwater management issues identified and the incorporation of green infrastructure. Further, the Highlands Council shares concern regarding climate change. Refer to Appendix D (Public and Stakeholder Outreach Documentation) for a copy of the letter response provided.

Additional examples of public outreach efforts by the Planning Partnership, and results of surveys distributed, are presented in Appendix D (Public and Stakeholder Outreach Documentation).

2.5 INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The Passaic County HMP strives to use the best available technical information, plans, studies and reports throughout the plan process to support hazard profiling; risk and vulnerability assessment; review and evaluation of mitigation capabilities; and the identification, development and prioritization of county and local mitigation strategies.

The asset and inventory data used for the risk and vulnerability assessments is presented in the County Profile (Section 3). Details of the source of this data, along with technical information on how the data was used to develop the risk and vulnerability assessment, is presented in the Risk Assessment, specifically in Section 4.2 Methodology and Tools, as well as throughout the hazard profiles in Section 4.4 (Hazard Profiles). Further, the source of technical data and information used may be found within the References section.

Plans, reports, and other technical information were identified and provided directly by the County, participating jurisdictions, and numerous stakeholders involved in the planning effort, as well as through independent research by the planning consultant. The County and participating jurisdictions were tasked with updating the inventory of their Planning and Regulatory capabilities in Section 9 (Jurisdictional Annexes) and providing relevant planning and regulatory documents, as applicable. Relevant documents, including plans, reports, and ordinances were reviewed to identify the following:

- Existing County and municipal capabilities.
- Needs and opportunities to develop or enhance capabilities, which may be identified within the County or local mitigation strategies.
- Mitigation-related goals or objectives considered in the review and update of the overall Goals and Objectives in Section 6 (Mitigation Strategy).
- Proposed, in-progress, or potential mitigation projects, actions, and initiatives to be incorporated into the updated County and local mitigation strategies.

The following local regulations, codes, ordinances, and plans were reviewed during this process to develop mitigation planning goals, objectives, and strategies that are consistent across local and regional planning and regulatory mechanisms to accomplish complementary and mutually supportive strategies:

- Master Plans
- Building Codes
- Zoning and Subdivision Ordinances
- NFIP Flood Damage Prevention Ordinances
- Site Plan Requirements
- Stormwater Management Plans
- Emergency Management and Response Plans
- Land Use and Open Space Plans
- Capital Plans
- New Jersey State Hazard Mitigation Plan (2019)

2.6 INTEGRATION WITH EXISTING PLANNING MECHANISMS AND PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and

programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those mechanisms.

Section 5 (Capability Assessment) provides a summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (federal, state, county, and local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9, the County and each participating jurisdiction identified how they integrated hazard risk management into their existing planning, regulatory, and operational/administrative framework (*integration capabilities*) and how they intend to promote this integration (*integration actions*).

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7 (Plan Maintenance).

2.7 CONTINUED PUBLIC INVOLVEMENT

Passaic County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This HMP update will be made available for review on the HMP public website. Each jurisdiction's elected official shall be responsible for receiving, tracking, and filing public comments regarding this HMP update.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the annual plan evaluation meeting (refer to Section 7 – Plan Maintenance) and posted on the public website at https://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php.

The public will be provided an opportunity to comment on the HMP update as a part of the annual mitigation planning evaluation process and the next five-year mitigation plan update. The HMP Coordinator (currently Robert A. Lyons, Office of Emergency Management) is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the 5-year plan update as appropriate; however, members of the Planning Partnership will assist the HMP Coordinator. Additional meetings may also be held as deemed necessary. The purpose of these meetings would be to provide the public an opportunity to express concerns, opinions, and ideas about the HMP.

Further details regarding continued public involvement are provided in Section 7 (Plan Maintenance).

After completion of this HMP update, implementation and ongoing maintenance will continue to be a function of the Planning Partnership. The Planning Partnership will review the plan and accept public comment as part of an annual review and as part of five-year mitigation plan updates.

A notice regarding annual updates of the plan will be publicized annually after the HMP Committee's annual evaluation and posted on the public web site.

Robert A. Lyons has been identified as the ongoing County HMP Coordinator (see Section 7), and is responsible for receiving, tracking, and filing public comments regarding this HMP update. Contact information is:

Mailing Address:	Passaic County Office of Emergency Management 300 Oldham Road, Wayne, NJ 07470
Contact Name:	Robert A. Lyons
Email Address:	pcoem@passaiccountynj.org

SECTION 3. COUNTY PROFILE

This profile describes the general information of Passaic County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located in Passaic County. In Section 4 (Risk Assessment), specific profile information is presented and analyzed to develop an understanding of the study area, including the economic, structural, and population assets at risk and the particular concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

2020 HMP Changes

- The "County Profile" is now located in Section 3; previously located in Section 4. It contains updated information regarding the County's physical setting, population and demographics and trends, general building stock, land use and trends, potential new development and critical facilities. This includes U.S. Census American Community Survey (ACS) 2017 and additional information regarding the New Jersey Highlands Region in the Development Trends/Future Development subsection.
- Critical facilities identified as community lifelines using FEMA's lifeline definition and seven categories were added to the inventory.

3.1 GENERAL INFORMATION

Passaic County was formed in 1837 from sections of Bergen and Essex Counties. The County is situated in northeastern New Jersey and is made up of 16 municipalities that span approximately 197 square miles. Passaic County is bordered to the north by New York State, to the south by Essex and Morris Counties, to the east by Bergen County, and to the west by Sussex County. The boundaries of the County naturally divide it into northern and southern halves. The northern section of Passaic County is older suburban and rural to semi-rural, entirely in the Highlands Preservation and Planning Areas, with scenic vistas and environmentally sensitive forested areas surrounding reservoirs. Southern Passaic County is suburban and urban and includes the Cities of Passaic, Clifton, and Paterson (Passaic County Department of Planning and Economic Development 2013).

The County is located in the U.S. Census-defined New York-New Jersey Metropolitan Statistical Area. It is located 11.5 miles from the George Washington Bridge, 13 miles from the Lincoln Tunnel, and 17 miles from the Holland Tunnel. Because of its central location, Passaic County boasts easy accessibility by automobile, bus, freight, passenger train, and air from the Tri-State Region. Passaic County is at the crossroads of a number of New Jersey's major interstate highways (Routes 80, 287, 3, 20, 21, 23, 46, the Garden State Parkway, and the New Jersey Turnpike), which link the County to New York, Pennsylvania, and Connecticut. The County's location also provides ready accessibility to three international airports (Newark Liberty, LaGuardia, and John F. Kennedy) along with major international shipping ports (Port Newark and the Elizabeth Marine Terminal). Major freight rail service includes Norfolk Southern and New York, Susquehanna and Western (Passaic County HMP 2010).

3.1.1 Physical Setting

This section presents the physical setting of the County, including: hydrography and hydrology, topography and geology, climate, and land use/land cover.

Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Passaic County. The major waterways within the County include: Upper Greenwood Lake, Greenwood Lake, Clinton Reservoir, Echo Lake,

Monksville Reservoir, Wanaque River, Wanaque Reservoir, Lake Iosoco, Pompton Lake, Point View Reservoir, Passaic River, Pompton River, Peckman River, and Third River. The Pompton and Pequannock Rivers border Passaic County to the south, which creates the border between Passaic and Morris Counties. In the southeastern portion of the County, the Passaic River forms the border between Bergen and Passaic Counties (Passaic County HMP 2010). The reservoirs in northern Passaic County provide drinking water to nearly four million residents in New Jersey's urban core, roughly half of the state's population (Passaic County Future 2013). Figure 3-1 illustrates the bodies of water found in Passaic County.

Passaic River Basin

The Passaic River is the second largest and the longest river in New Jersey with its main stem approximately 80 miles long. The Passaic River Basin is about 935 square miles and covers seven New Jersey counties and two New York State counties. The major tributaries of the Passaic River Basin include the Whippany, Rockaway, Pequannock, Wanaque, Ramapo, Pompton, Saddle, Third, and Second Rivers. The Passaic River flows from its source in Mendham Township (Morris County) through the Great Swamp National Wildlife Refuge, and then turns northeast. In the City of Paterson (Passaic County), the river plunges over the Great Falls and then flows south into Newark Bay and ultimately the Atlantic Ocean (Passaic River Institute of Montclair State University 2014).

The Passaic River Basin had three distinct geophysical regions: the Highlands, where most of the major tributaries originate; the Central Basin, where approximately 27,000 acres of freshwater wetlands exist; and the Lower Valley, which defines the stretch of river from Little Falls to Newark Bay. The river can be divided into sections: the Upper Passaic and the Lower Passaic (New Jersey Audubon Society 1999).

The upper section of the river is nearly 50 miles long and drains about 200 square miles. About half of this section is undeveloped while the other portion is mainly suburban residential and commercial. This section of the Passaic River and its tributaries (Pequannock, Rockaway, Wanaque, Ramapo, and Pompton Rivers) are a source of drinking water for millions of northern New Jersey residents. Interconnected systems deliver water through the New Jersey District Water Supply Commission, serving 107 municipalities; the Passaic Valley Water Commission serving the Cities of Clifton, Paterson, and Passaic and numerous surrounding municipalities; and the New Jersey American Water Company which serves 42 municipalities (Passaic River Institute of Montclair State University 2014).

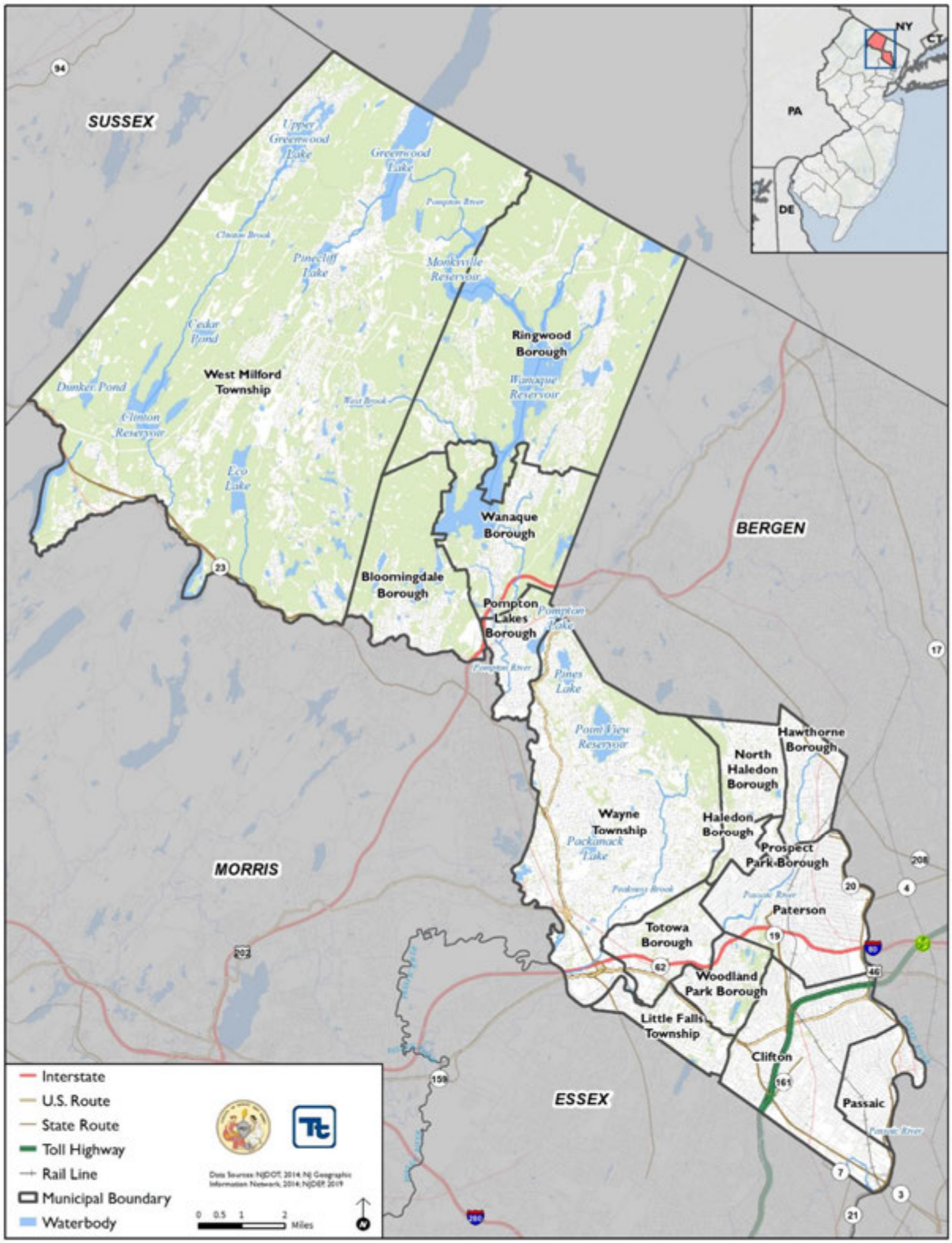
The Passaic River Basin is one of the most densely developed floodplains in the eastern U.S. It has a population density of 8,656 people per square mile with 2.5 million residents (50,000 living in the floodplain) and approximately 20,000 homes, businesses, and public buildings. The main stem of the Passaic River and its major tributaries have a 1% annual chance flood area that covers 60 square miles. This amounts to a drainage area of 1,134 square miles which receives an average of 50.08 inches of rain each year (Passaic County Future 2013).

Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams.

In New Jersey, the State is divided into 20 Watershed Management Areas (WMA), which are made up of smaller watersheds. Passaic County is located in three of the 20 WMAs that are discussed further below: Wallkill (WMA 2); Pompton, Pequannock, Wanaque, Ramapo (WMA 3) and Lower Passaic, Saddle River (WMA 4).

Figure 3-1. Overview Map Passaic County, New Jersey



Watershed Management Area 2: Wallkill River Watershed

Approximately eight squares miles (3.9%) of Passaic County is located in WMA 2. Only the Township of West Milford is located in this area. This WMA is also known as the Wallkill River Watershed and includes 11 townships in Sussex County. The Wallkill River Watershed is unique in that its headwaters begin at Lake Mohawk in Sparta Township and then flow north into New York, eventually emptying into the Hudson River. Within WMA 2, there are four subwatersheds: the Wallkill River, Pochuck Creek, Papakating Creek, and Rutgers Creek Tributaries.

The Wallkill Watershed is approximately 208 square miles in area and is comprised of a variety of land uses including rural and centralized residential development, agriculture, commercial, recreational, and industrial usage. Also located within this watershed area is the Wallkill National Wildlife Refuge. The refuge watershed/wetlands complex provides migratory and nesting habitats for numerous birds and waterfowl and is home to several endangered species.

Watershed Management Area 3: Pompton, Pequannock, Wanaque, Ramapo Watersheds

Approximately 135 squares miles (68.6%) of Passaic County is located in WMA 3. The Boroughs of Bloomingdale, Pompton Lakes, Ringwood, and Wanaque, and the Townships of Wayne and West Milford are all located within WMA 3. This WMA is located within the Highlands Province of New Jersey. The Pequannock, Wanaque, and Ramapo Rivers all flow into the Pompton River. The Pompton River is, in turn, a major tributary to the Upper Passaic River. WMA 3 contains some of the state's major water supply reservoir systems including the Wanaque Reservoir which is the largest surface water reservoir in New Jersey. There are four watersheds in WMA 3: Pompton, Ramapo, Pequannock and Wanaque River Watersheds. WMA 3 lies mostly in Passaic County but also includes parts of Bergen, Morris, and Sussex Counties (NJDEP 2012a).

Watershed Management Area 4: Lower Passaic, Saddle River

Approximately 54 squares miles (27.5%) of Passaic County is located in WMA 4. The Cities of Clifton, Passaic, and Paterson, the Boroughs of Haledon, Hawthorne, North Haledon, Prospect Park, Totowa, and West Paterson, and the Townships of Little Falls and Wayne are all located within WMA 4. This WMA includes the Lower Passaic River (from the Pompton River confluence downstream to the Newark Bay) and its tributaries, including the Saddle River. The WMA 4 drainage area is approximately 180 square miles and lies within portions of Passaic, Essex, Hudson, Morris, and Bergen Counties (NJDEP 2012b).

Two watersheds comprise WMA 4: the Lower Passaic River Watershed and Saddle River Watershed. The Lower Passaic River Watershed originates from the confluence of the Pompton River downstream to the Newark Bay. This 33-mile section meanders through Bergen, Hudson, Passaic, and Essex Counties and includes a number of falls, culminating with the Great Falls in Paterson. This watershed has a drainage area of approximately 129 square miles. The major tributaries to this section of the Passaic River are the Saddle River, Preakness Brook, Second River, and Third River. The Saddle River is one of the larger tributaries to the Lower Passaic River. The Saddle River Watershed has a drainage area of approximately 51 square miles. Land in this watershed is extensively developed and contains many older cities and industrial centers including Newark, Paterson, Clifton, and East Orange (NJDEP 2012b).

Topography and Geology

Passaic County has a unique topography. Its name is derived from the Lenni Lenape word for valley, *pasaeck*. Northern Passaic County is generally characterized by long, even ridges that are separated by narrow, continuous valleys. This area of the county is part of the Appalachian Mountain chain, which extends from Newfoundland, Canada to central Alabama. The highest elevation in Passaic County is at Bearfort Ridge in West Milford, which reaches heights of approximately 1,480 feet above sea level. The municipalities of West Milford, Ringwood,

Bloomingdale, Wanaque, and Pompton Lakes are located in northern Passaic County. This section of the county is part of the special water resource administrative region of the New Jersey Highlands Region. Development within the Preservation Area is subject to special state regulations that are intended to promote open space conservation and protection natural resources (County Open Space Plan 2014).

In the southern portion of the County, the terrain becomes progressively less variable, and valleys are wider as one moves to the east. The last major ridge is Garret Mountain, which is over 500 feet tall and is the location of Garret Mountain Reservation and Rifle Camp Park. Garret Mountain is also the northernmost part of First Watchung Mountain which is one of several national natural landmarks in New Jersey. The lowest elevation of Passaic County is located to the east of Garret Mountain, along the Passaic River in the City of Clifton (County Open Space Plan 2014).

Passaic County is located within the Highlands and Piedmont Provinces, two of the four major physiographic regions of New Jersey. The Highlands Province occupies an area of approximately 980 square miles and lies within the southeastern portions of Hunterdon, Morris, and Passaic Counties and small parts of Bergen and Somerset Counties. This mountainous belt is approximately 10 miles wide at the Delaware River and 25 miles wide near the New York State border. In general, this part of New Jersey has a rugged topography that consists of a series of discontinuous rounded ridges separated by deep narrow valleys. Wawayanada Mountain is the highest point in the Highlands at 1,496 feet above sea level. Ramapo Mountain (1,171 feet) is the highest point on the southeast side of the Highlands (Dalton 2003).

The Piedmont Province has an area of approximately 1,600 square miles and makes up about one-fifth of the state. It occupies all of Essex, Hudson and Union Counties, most of Bergen, Hunterdon, and Somerset Counties, and parts of Mercer, Middlesex, Morris, and Passaic Counties. The Piedmont Province is mainly underlain by slightly folded and faulted sedimentary rocks of the Triassic and Jurassic period and igneous rocks of the Jurassic period. The elevation of the Piedmont Province generally ranges from 300 to 400 feet above sea level, with the highest point at 914 feet is Barren Ridge (Dalton 2003).

Climate

The State of New Jersey is located approximately halfway between the equator and the North Pole, resulting in a climate that is influenced by wet, dry, hot, and cold airstreams, making a highly variable environment. The dominant feature of the atmospheric circulation over North America, including New Jersey, is the broad, undulating flow from west to east across the middle latitudes of the continent. This pattern exerts a major influence on the weather throughout the State (Office of the New Jersey State Climatologist [ONJSC] n.d.).

The State of New Jersey is divided into five distinct climate zones. Distinct variations in the day-to-day weather between each of the climate zones is due to the geology distance from the Atlantic Ocean, and prevailing atmospheric flow patterns. The five climate zones in New Jersey are: Northern, Central, Pine Barrens, Southwest, and Coastal (ONJSC n.d.). Passaic County is located in the Northern and Central climate zones, which are described below.

The Northern Climate Zone covers approximately one-quarter of New Jersey and consists mainly of elevated highlands and valleys which are part of the Appalachian Uplands. This zone can be characterized by having a continental type of climate with minimal influence from the Atlantic Ocean, except when the winds contain an easterly component. Annual snowfall averages 40 to 50 inches. During the warmer months, thunderstorms are responsible for most of the rainfall. The climate zone has the shortest growing season, about 155 days (ONJSC n.d.).

The Central Zone has a northeast to southwest orientation, running from New York Harbor and the Lower Hudson River to the Great Bend of the Delaware River near the City of Trenton. The northern edge of the Central Zone is often the boundary between freezing and non-freezing precipitation in the State (ONJSC n.d.).

Passaic County's average high temperature arrives in July at 84.1°F, and the average low of 18.4°F occurs in January. The temperature is rarely below 0°F or above 100°F. Precipitation is evenly distributed throughout the year. Passaic County receives on average 48.78 inches of rain a year. Spring and summer frontal systems can produce high rainfall amounts and spawn tornados. Tropical storm systems can affect the Northern Atlantic Seaboard from late summer to late fall.

Land Use, Land Cover, and Land Use Trends

Passaic County is diverse and has a significantly varied landscape. It is paralleled by socioeconomic, religious, cultural, and historical diversity among the county's population. The northern half of the County, predominately the Highlands Region, is mostly forested land. It is dominated by state and county parkland, preserved watershed lands, and agriculture. Land use in the southern portion of the County is more diverse and dominated by residential, commercial, and industrial uses, which is considered urban land use according to the National Land Cover Dataset (Passaic County Planning Department 2012). This can be seen in Figure 3-2.

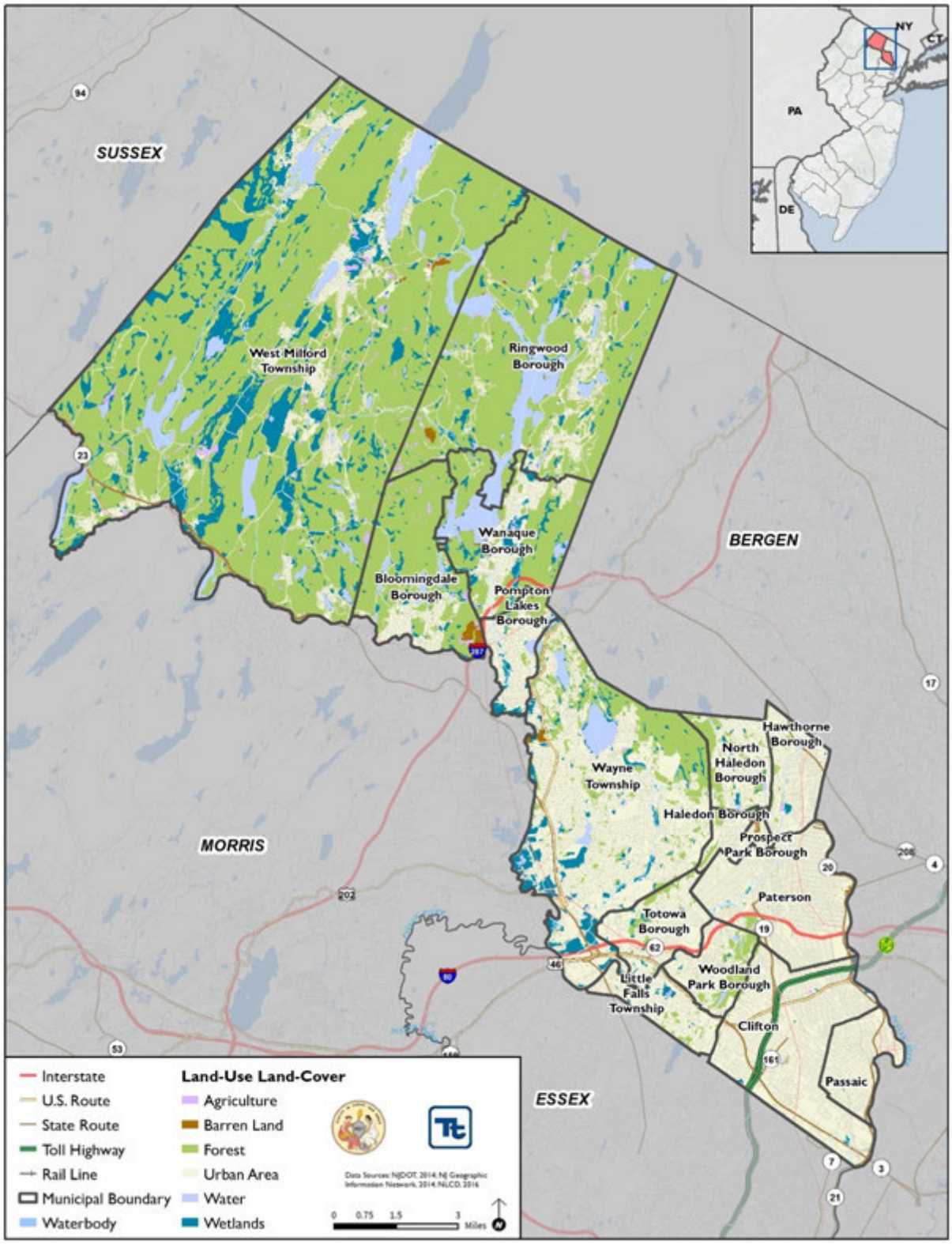
In 2007, the majority, or 47.8%, of the land in Passaic County was designated as forested land. The 2016 figures show that there was a very slight decrease in forested land, indicating that approximately 47.5% of the County was forested. In 2007, 37% was urban land; 7.0% was wetlands; 0.70% was barren land; and 0.40% was agricultural lands. When compared with the land use land cover data set from 2016, there has been an increase in agricultural land (+0.49%), urban land (+0.12%) and wetlands (+1.17%) and a decrease in barren land (-0.34%). Refer to Table 3-1 and Figure 3-2 below.

Table 3-1. Land Use Summary for Passaic County, 2007 and 2016

Land Use Category	2007 Data		2016 Data	
	Acreage	Percent of Passaic County	Acreage	Percent of Passaic County
Agriculture	442.9	0.4%	1,135.75	0.89%
Barren	896.1	0.7%	453.08	0.36%
Forest	60,634.3	47.8%	60,263.20	47.5%
Urban	46,913.4	37.0%	47,110.79	37.1%
Wetlands	8,852.2	7.0%	10,368.33	8.2%

Source: NLCD (2016 LULC)
Note: Urban land includes residential, industrial, transportation, and recreational land. Open water is excluded from the table above.

Figure 3-2. 2016 Land Use/Land Cover for Passaic County

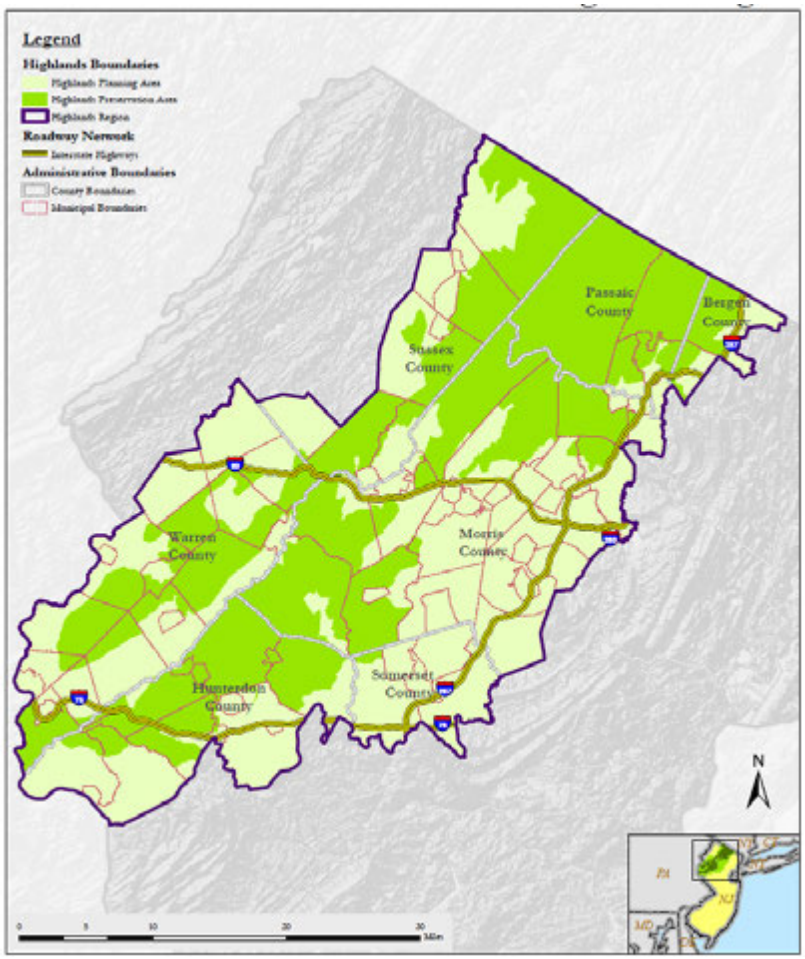


Highlands Region of New Jersey

The New Jersey Highlands is a 1,343 square mile area (over 800,000 acres) in the northwest portion of New Jersey. It is noted for its scenic beauty, environmental significance and serves as a vital source of drinking water for over half of New Jersey residents. The Highlands stretches from Phillipsburg (Warren County) in southwest New Jersey to Ringwood (Passaic County) in the northeast. The Highlands Region lies within portions of seven counties, Hunterdon, Somerset, Sussex, Warren, Morris, Passaic and Bergen, and includes 88 municipalities. The Highlands Act designates approximately 398,000 acres as the Highlands Preservation Area which is identified as an area of exceptional natural resource value. The remainder of the Highlands Region that is not located within the Preservation Area lies within the Highlands Planning Area. The distinction between the Preservation and Planning Area is that municipal and county conformance with the Highlands Regional Master Plan is required in the Preservation Area, and voluntary in the Planning Area.

The Highlands Area in Passaic County is located in the northern portion of the County and consists of approximately 78,789 acres of land (Figure 3-3). The Township of West Milford and Borough of Ringwood are entirely within the Highlands Preservation Area, while the Boroughs of Wanaque and Bloomingdale are primarily in the Preservation Area and partially in the Planning Areas. The Borough of Pompton Lakes is entirely within the Planning Area (Passaic County Future 2013).

Figure 3-3. Highlands Region



Source: New Jersey Highlands Council 2016

Open Space and Parkland

Open space preservation is a priority in Passaic County. Increasing green space and preserved open space can attract investment, raise property values, revitalize cities, reduce crime, boost tourism, and prevent flood damage (Passaic County Future 2013). There are approximately 56,837 acres of dedicated park, recreation, and open space areas within Passaic County. Of these areas, non-profit organizations and similar organizations control 1,803 acres; the federal government controls 57 acres; the State of New Jersey controls 29,849 acres; municipalities control 4,837 acres; the Newark Watershed Conservation and Development Corporation controls 16,351 acres; and 3,940 acres are controlled by the County or its non-profit partners and are part of the Passaic County Park System (Passaic County Open Space Plan 2014). The Passaic County Park System has a total area of 3,940 acres and is made up of 11 park, recreation, and open space areas that are located in 11 of the County's 16 municipalities. Refer to Table 3-2 below for a summary of the Passaic County Parks.

Table 3-2. Passaic County Parks

County Park	Acreage	Location
Apshawa Preserve	594	Township of West Milford
Friendship Park	44	Borough of Bloomingdale
Garret Mountain Reservation	310	City of Paterson and Borough of Woodland Park
Goffle Brook Park	100	Borough of Hawthorne
Peckman Preserve	12	Township of Little Falls
Pompton Aquatic Park	~29	Township of Wayne and Borough of Pompton Lakes
Preakness Valley Park	377	Township of Wayne and Borough of Totowa
Rifle Camp Park	169	Borough of Woodland Park
San Cap Park	224	Township of West Milford
Tranquility Ridge Park	2,062	Township of West Milford and Borough of Ringwood
Weasel Brook Park	19	City of Clifton

Source: Passaic County Open Space Plan 2014

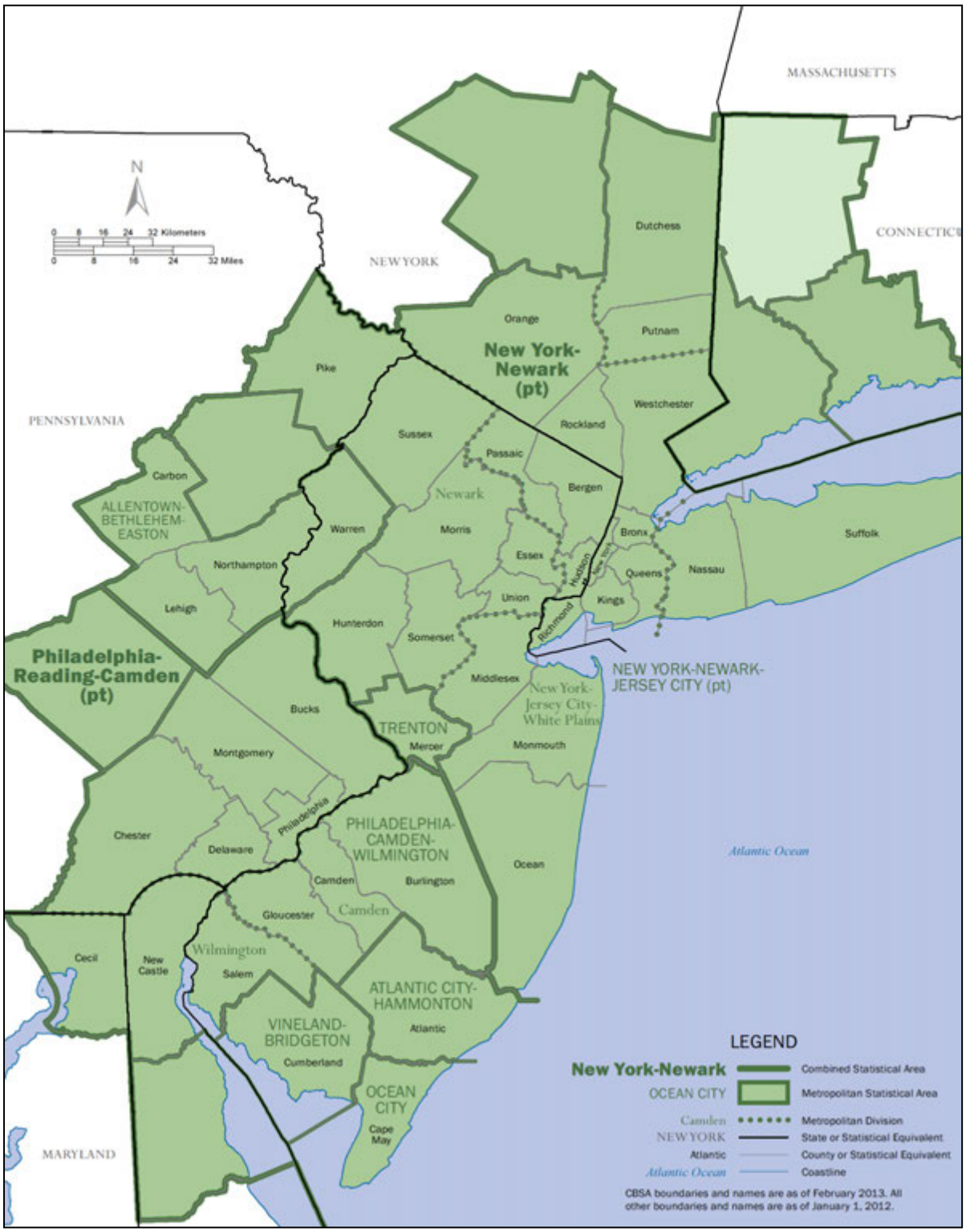
Metropolitan Statistical Area

Metropolitan statistical areas (MSA) are geographic entities delineated by the New Jersey Office of Management and Budget (OMB) for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. The general concept of a metropolitan area is that of a large nucleus, together with adjacent communities, having a high degree of social and economic integration with that core (U.S. Census 2014).

Northeast New Jersey and portions of New York State are located in the New York-Newark Combined Statistical Area. This area is broken down into smaller MSAs. Passaic County is located within the New York-Newark Combined Statistical Area and the New York-Newark-Jersey City MSA (U.S. Census 2014).

Due to the size of the New York-Newark-Jersey City MSA, it is further divided into four metropolitan divisions which are separately identifiable employments centers within the MSA. Passaic County is part of the New York-Jersey City-White Plains NY-NJ Metropolitan Division labor market (Camoin Associates 2014). Figure 3-4 illustrates the different statistical areas in New Jersey and parts of New York State.

Figure 3-4. New Jersey-New York Combined Statistical Area



Source: U.S. Census 2014

3.2 POPULATION AND DEMOGRAPHICS

Knowledge of the composition of the population, how it has changed in the past and how it may change in the future is needed to make informed decisions. Information about population is a critical part of planning because it directly relates to needs such as housing, industry, stores, public facilities and services, and transportation.

3.2.1 Population Characteristics

The population of Passaic County was estimated at 510,563 in the 2013-2017 American Community Survey (ACS). According to the 2010 U.S. Census, Passaic County had a population of 501,226 people which represents a significant increase (+2.5%) from the 2000 U.S. Census population of 489,049 people. HAZUS-MH demographic data will be used in the loss estimating analyses in Section 4 (Risk Assessment) of this plan. All demographic data in HAZUS corresponds to the 2010 U.S. Census.

Table 3-3 presents the population statistics for Passaic County based on the 2000 and 2010 decennial Census' and the 2013-2017 ACS 5-Year Estimates. Figure 3-5 shows the distribution of the general population density (persons per square mile) in 2010 by Census block.

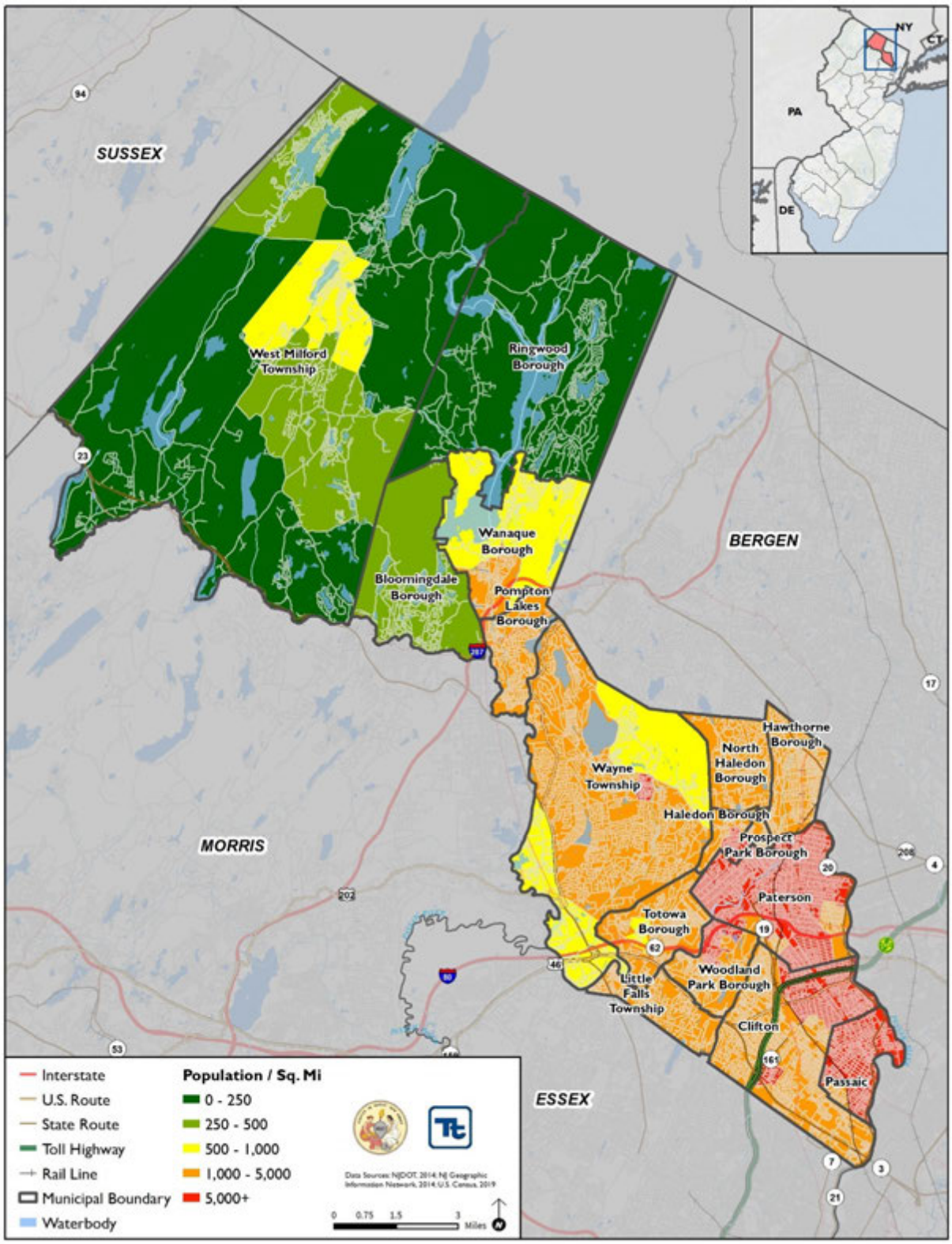
Northern Passaic County is not as densely populated as southern Passaic County due to its location within the Highlands Region of New Jersey. Southern Passaic County contains a majority (86.4%) of the County's total population. This is largely due to the historic development patterns, which may be attributed to the location of the Passaic River and its historic use as a power source for mills and factories dating back to 1791, as well as the location and historic development of major transportation networks in the second half of the 20th century, and more recently, the passage of the Highlands Act (County Open Space Plan 2014).

Table 3-3. Passaic County Population Statistics

Municipality	2000 Census Total	2010 Census Total	2013-2017 ACS						
			Total	Pop. 65+	Percent (%) Pop. 65+	Pop. Under 5	Percent (%) Pop. Under 5	Below Poverty Level*	Percent (%) Below Poverty Level
Borough of Bloomingdale	7,610	7,656	8,139	1,382	17.0%	616	7.6%	659	8.1%
City of Clifton	78,672	84,136	86,132	12,713	14.8%	5,340	6.2%	8,182	9.5%
Borough of Haledon	8,278	8,318	8,453	1,047	12.4%	498	5.9%	1,095	13.0%
Borough of Hawthorne	18,218	18,791	19,065	2,873	15.1%	1,317	6.9%	967	5.1%
Township of Little Falls	10,989	14,432	14,507	2,551	17.6%	604	4.2%	916	6.3%
Borough of North Haledon	7,920	8,417	8,564	2,075	24.2%	245	2.9%	248	2.9%
City of Passaic	67,861	69,781	71,158	5,923	8.3%	6,949	9.8%	23,501	33.0%
City of Paterson	149,208	146,199	147,907	15,693	10.6%	11,484	7.8%	43,049	29.1%
Borough of Pompton Lakes	10,640	11,097	11,205	1,533	13.7%	560	5.0%	610	5.4%
Borough of Prospect Park	5,767	5,865	5,938	490	8.2%	446	7.5%	1,134	19.1%
Borough of Ringwood	12,384	12,228	12,455	1,822	14.6%	722	5.8%	290	2.3%
Borough of Totowa	9,891	10,804	10,807	2,040	18.9%	446	4.1%	646	6.0%
Borough of Wanaque	10,278	11,116	11,778	2,594	22.0%	645	5.5%	739	6.3%
Township of Wayne	53,905	54,717	55,154	10,072	18.3%	2,746	5.0%	2,530	4.6%
Township of West Milford	26,410	25,850	26,759	4,150	15.5%	1,426	5.3%	1,323	4.9%
Borough of Woodland Park	11,018	11,819	12,542	2,472	19.7%	798	6.4%	777	6.2%
Passaic County (Total)	**489,049**	**501,226**	**510,563**	**69,429**	**13.6%**	**34,842**	**6.8%**	**86,667**	**17.0%**

Source: *U.S. Census Bureau: Census 2000, 2010, 2013-2017; HAZUS-MH (for 2010 U.S. Census data)*
Note: *ACS = American Community Survey*
Pop. = population
** Individuals below poverty level (Census poverty weighted average threshold for a 3-person family unit is approximately $19,515)*

Figure 3-5. Distribution of General Population for Passaic County, New Jersey



3.2.2 Vulnerable Populations

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response and mitigation actions. For the purposes of this planning process, vulnerable populations in Passaic County include children, elderly, low-income, the physically or mentally disabled, non-English speakers and the medically or chemically dependent.

Age

Children are considered vulnerable because they are dependent on others to safely access resources during emergencies. The elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. Those living on their own may have more difficulty evacuating their homes. The elderly are also more likely to live in senior care and living facilities where emergency preparedness occurs at the discretion of facility operators. Senior care and living facilities are also most vulnerable to hazards like pandemics in light of the close living arrangements combined with older populations with potentially weakened immune systems or pre-existing health issues that may be accentuated during an event like a pandemic.

According to the 2013-2017 ACS 5-Year estimates, the mean age in Passaic County was 36.9 years. Of the 2013-2017 population, 69,429 (13.6%) of the County's population is age 65 and older; an increase from 2010 (12.1%). According to the 2013-2017 ACS 5-Year estimates, there were 34,842 (6.8%) under the age of 5; a slight increase from (34,107). Figure 3-6 shows the distribution of persons over the age of 65 and under the age 5 in Passaic County, based on the 2013-2017 ACS.

Income

Of the total population, economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and may not have funds to evacuate. The 2014-2018 ACS data identified approximately 31,022 households as having an annual income of less than $25,000 and are therefore below the poverty level for a household with a family of four persons. According to the Census' 2019 poverty thresholds, the weighted average thresholds for a family of four in 2019 was $26,167; for a family of three, $20,347; for a family of two, $16,541, and for unrelated individuals, $13,016. Figure 3-6 shows the distribution of low-income persons in Passaic County.

It is noted that the Census data for household income provided in HAZUS-MH includes two ranges ($0-10,000 and $10,000-$20,000/year) that were totaled to provide the "low-income" data used in this study. This does not correspond exactly with the "poverty" thresholds established by the updated ACS statistics; however, this difference is not believed to be significant for the purposes of this planning effort.

Physically or Mentally Disabled

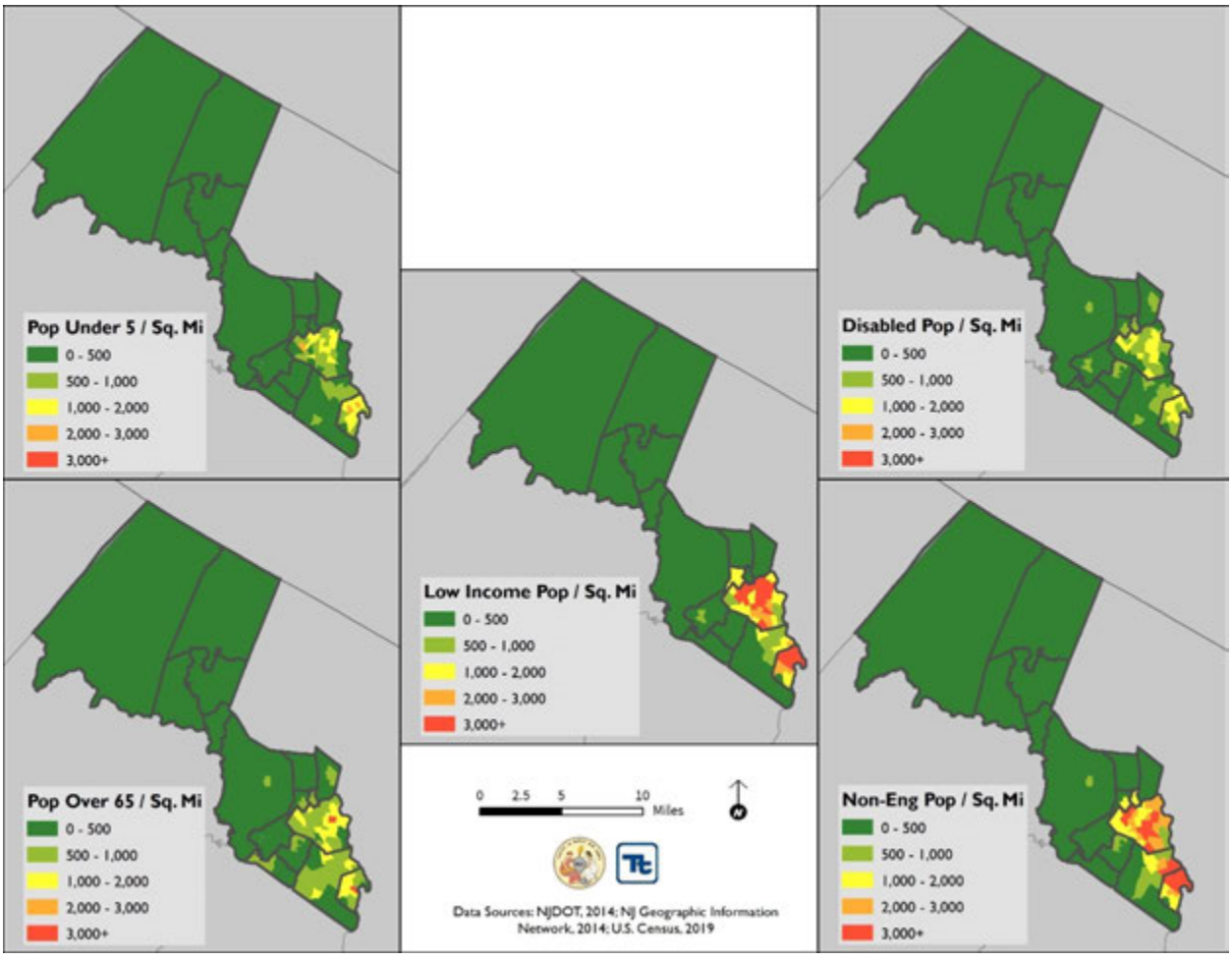
"Persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity (Center for Disease Control, 2015)." These impairments may increase the level of difficulty that individuals may face during an emergency. Cognitive impairments may reduce an individual's capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability may face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2014-2018 ACS, 9.3% percent residents of Passaic County are living with a disability. Figure 3-6 shows the geographic distribution of disabled individuals throughout Passaic County which includes individuals with hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.

Non-English Speakers

Individuals who are not fluent or have a working proficiency in English may be vulnerable to hazard events because they may have difficulty with understanding information being conveyed to them. Cultural differences can also add complexity to how information is being conveyed to populations with limited proficiency of English (Centers for Disease Control 2015).

According to the 2013-2017 ACS, 50.2% of the County's population over the age of 5 speaks a language other than English at home; this is significantly greater than the State average of 30.0%. Of the communities in Passaic County, the Cities of Passaic (76.1%) and Paterson (62.1%) and the Boroughs of Prospect Park (64.7%) and Haledon (59.8%) have a larger proportion of non-English speaking households than English-speaking households. The primary non-English language spoken in these homes is Spanish; this is most prevalent in the City of Passaic, where 69.5% of the population speaks Spanish at home.

Figure 3-6. Distribution of Socially Vulnerable Populations in Passaic County, New Jersey



3.2.3 Population Trends

This section discusses population trends to use as a basis for estimating future changes of the population and significantly change the character of the area. Population trends can provide a basis for making decisions on the

type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

According to the 2013-2017 ACS, Passaic County's population was 510,563 persons, which is 1.9% increase from the 2010 Census population of 501,226. Between 1900 and 2010, the County has experienced overall population growth. Between 1970 and 1980, the County experienced a 2.9% increase. The largest increase was between 1900 and 1910 with 39.1% growth. The smallest increase was experienced between 1980 and 1990, when Passaic County had a 1.2% increase in population (New Jersey Department of Labor and Workforce Development 2014).

In 2018, Passaic County's population ranked 9th in New Jersey (New Jersey Department of Labor and Workforce Development 2014). Over the past 10 years, the County experienced a slow but steady population growth and is expected to grow in the coming years. Table 3-4 summarizes population change from 1900 to 2017 in Passaic County.

Table 3-4. Passaic County Population Trends, 1900 to 2017

Year	Population	Change in Population	Percent (%) Population Change
1900	155,202	N/A	N/A
1910	215,902	60,700	39.1
1920	259,174	43,272	20.0
1930	302,129	42,955	16.6
1940	309,353	7,224	2.4
1950	337,093	27,740	9.0
1960	406,618	69,525	20.6
1970	460,782	54,164	13.3
1980	447,585	-13,197	-2.9
1990	453,060	5,475	1.2
2000	489,049	35,989	7.9
2010	501,226	12,177	2.5
2017	510,563	9,337	1.9

Source: U.S. Census Bureau 2018
Note: Change in population and percent in population change was calculated from available data
N/A Not Applicable

Table 3-5 displays the ten largest municipalities in Passaic County. According to this 2013-2017 ACS data, the City of Paterson was the most populous municipality, comprising 29.0% of the County's total population. The City was also the third most populous municipality in New Jersey. From 2010 to 2017, the Borough of Bloomingdale was the fastest growing municipality, increasing by 6.3%. Over the same period of time, not a single Passaic County municipality experienced a decline in population (New Jersey Department of Labor and Workforce Development 2014).

Table 3-5. Ten Largest Municipalities in Passaic County

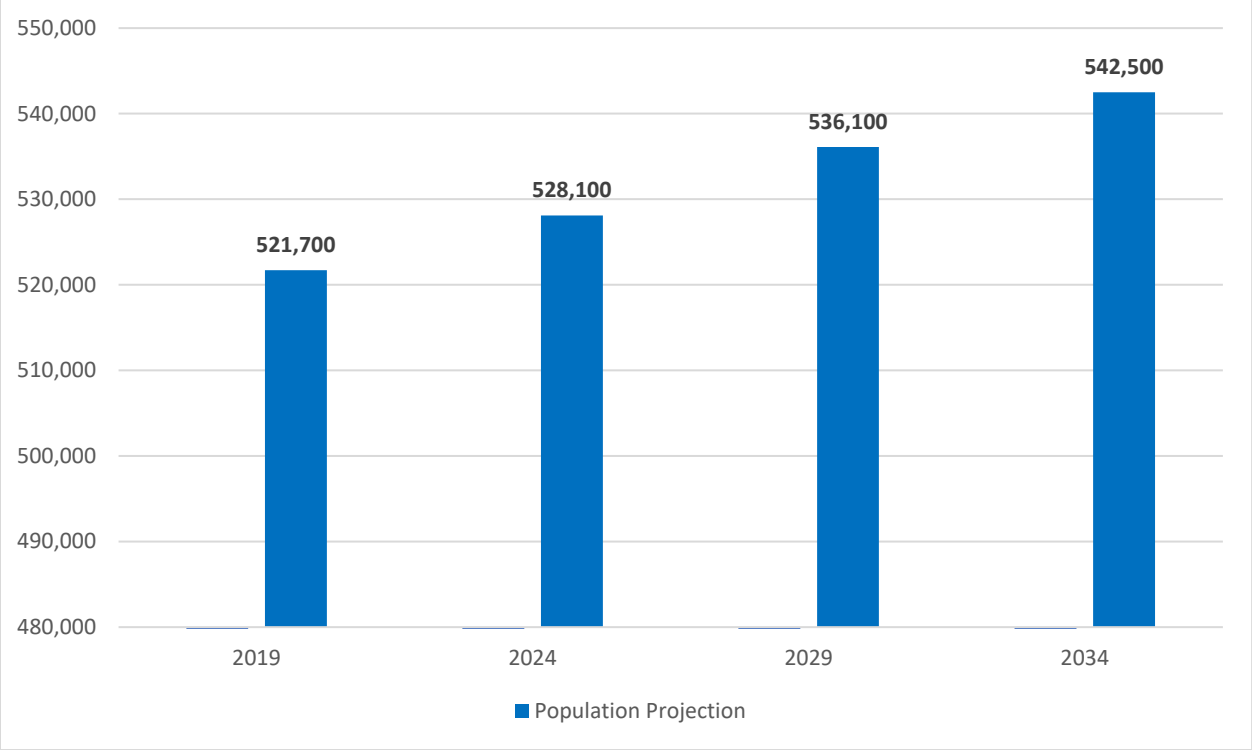
Rank	Municipality	2013-2017 ACS Population
1	City of Paterson	147,907

Rank	Municipality	2013-2017 ACS Population
2	City of Clifton	86,132
3	City of Passaic	71,158
4	Township of Wayne	55,154
5	Township of West Milford	26,759
6	Borough of Hawthorne	19,065
7	Township of Little Falls,	14,507
8	Borough of Woodland Park	12,542
9	Borough of Ringwood	12,455
10	Borough of Wanaque	11,778

Source: New Jersey Department of Labor and Workforce Development 2014

Over the next 15 years, from 2019 to 2034, Passaic County has a projected population growth of 4%. Based on New Jersey Department of Labor population projections, the County population is expected to reach 528,100 by 2024, 536,100 by 2029, and 542,500 by 2034 (Figure 3-7).

Figure 3-7. Passaic County Population Projections, 2019 to 2034



Source: New Jersey Department of Labor and Workforce Development 2014

Table 3-6. Population Trends in Passaic County by Municipality

Municipality	2010 Census	2013-2017 ACS	Change in Population	Percent (%) Population Change
Borough of Bloomingdale	7,656	8,139	483	+6.31%
City of Clifton	84,136	86,132	1,996	+2.37%
Borough of Haledon	8,318	8,453	135	+1.62%
Borough of Hawthorne	18,791	19,065	274	+1.46%
Township of Little Falls	14,432	14,507	75	+0.52%
Borough of North Haledon	8,417	8,564	147	+1.75%
City of Passaic	69,781	71,158	1,377	+1.97%
City of Paterson	146,199	147,907	1,708	+1.17%
Borough of Pompton Lakes	11,097	11,205	108	+0.97%
Borough of Prospect Park	5,865	5,938	73	+1.24%
Borough of Ringwood	12,228	12,455	227	+1.86%
Borough of Totowa	10,804	10,807	3	+0.03%
Borough of Wanaque	11,116	11,778	662	+5.96%
Township of Wayne	54,717	55,154	437	+0.80%
Township of West Milford	25,850	26,759	909	+3.52%
Borough of Woodland Park	11,819	12,542	723	+6.12%
Passaic County (Total)	**501,226**	**510,563**	**9,337**	**+1.9%**

Source: Passaic County Open Space Plan 2014; U.S. Census ACS 2018

Between 2010 and 2017, all municipalities experienced an increase in population. The major areas of growth were in Bloomingdale, Woodland Park, Wanaque, and West Milford. Of the four municipalities, only Woodland Park is located in the southern, more populated, portion of the County. The remaining three municipalities are all located in the northern half of the County, an area known for primarily forested and non-developed areas.

3.3 GENERAL BUILDING STOCK

The 2013-2017 ACS data identified 162,440 households (176,843 housing units) in Passaic County which is a small decrease in total (-2.7%) but an increase in housing units (+0.05%) from 2010 to 2017. The U.S. Census defines a household as all persons who occupy a housing unit, and a housing unit as a house, apartment, mobile home, group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Therefore, you may have more than one household per housing unit. The median price of a single-family home in Passaic County was estimated at $333,200 (ACS, 2013-2017).

For the HMP update, a custom-building inventory was developed to assess the current built environment's risk to natural hazards. The building stock update was performed using the most current parcel and tax assessment data provided by the New Jersey Geographic Information Network. There are approximately 116,348 structures included in the custom-building inventory with an estimated replacement cost value of approximately $164 billion (structure and contents). Estimated content value was calculated by using 50-percent of the residential replacement cost value, and 100-percent of the non-residential values. Actual content value various widely depending on the usage of the structure. Approximately 89% of the total buildings in the County are residential,

which make up approximately 39.1% of the County's total replacement cost value. Table 3-7 presents building stock statistics by occupancy class for Passaic County.

Table 3-7. Number of Buildings and Replacement Cost Value by Occupancy Class

Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	RCV (Structure Only)	RCV (Contents Only)	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)	Count	Total RCV (Structure + Contents)
Borough of Bloomingdale	2,611	$1,055,238,955	$728,903,984	$1,784,142,939	2,442	$1,012,924,729	101	$533,728,793	6	$56,533,024
City of Clifton	21,859	$11,540,808,220	$10,108,686,984	$21,649,495,205	20,105	$8,124,445,916	1,045	$5,871,746,617	431	$6,380,137,011
Borough of Haledon	1,809	$928,618,621	$779,972,868	$1,708,591,489	1,614	$587,232,960	136	$577,033,378	28	$221,518,763
Borough of Hawthorne	5,923	$2,571,037,879	$2,017,025,207	$4,588,063,085	5,438	$2,278,575,584	270	$854,548,210	117	$1,027,562,615
Township of Little Falls	3,412	$2,455,339,843	$2,178,361,807	$4,633,701,650	3,026	$1,397,779,153	195	$1,739,285,591	41	$348,401,576
Borough of North Haledon	2,698	$1,363,416,532	$953,860,738	$2,317,277,271	2,552	$1,275,068,245	89	$563,513,718	5	$44,889,175
City of Passaic	6,918	$6,321,546,172	$5,626,799,272	$11,948,345,444	5,522	$3,155,653,060	1,042	$4,599,025,502	82	$1,664,060,778
City of Paterson	23,609	$29,121,163,571	$26,863,598,630	$55,984,762,201	18,571	$10,826,193,107	3,575	$33,173,726,426	536	$5,841,493,875
Borough of Pompton Lakes	3,081	$1,085,097,997	$768,681,606	$1,853,779,603	2,835	$1,033,182,155	143	$453,426,003	14	$125,462,676
Borough of Prospect Park	1,101	$432,342,039	$276,976,542	$709,318,581	1,032	$466,259,829	54	$190,099,730	2	$272,232
Borough of Ringwood	4,486	$1,629,468,436	$1,094,553,047	$2,724,021,483	4,285	$1,761,995,360	61	$201,428,010	29	$234,932,706
Borough of Totowa	3,771	$3,229,813,301	$3,246,537,368	$6,476,350,669	3,400	$1,432,138,437	234	$2,244,716,033	82	$2,467,971,151
Borough of Wanaque	3,157	$1,261,524,068	$949,625,196	$2,211,149,264	2,941	$1,056,202,665	102	$478,138,115	17	$188,340,474
Township of Wayne	17,646	$11,008,612,333	$8,117,160,740	$19,125,773,073	16,615	$10,161,068,599	556	$4,385,456,387	98	$1,831,878,214
Township of West Milford	10,794	$5,393,212,302	$3,955,107,065	$9,348,319,367	9,968	$4,525,965,200	270	$1,351,450,602	42	$335,762,397
Borough of Woodland Park	3,473	$11,034,703,412	$6,099,969,140	$17,134,672,551	3,223	$15,069,356,603	166	$1,379,637,993	28	$441,922,977
Passaic County (Total)	**116,348**	**$90,431,943,680**	**$73,765,820,194**	**$164,197,763,874**	**103,569**	**$64,164,041,601**	**8,039**	**$58,596,961,109**	**1,558**	**$21,211,139,646**

Source: New Jersey Geographic Information Network 2019

RCV = Replacement Cost Value

The 2013-2017 ACS for Passaic County identified that the majority of housing units (41.8%) are one-unit detached units. The 2017 U.S. Census Bureau's County Business Patterns data identified a total 12,158 business establishments employ 144,817 people in Passaic County. The Retail Trade industry has the greatest number of establishments in the County, with 1,867 and the Healthcare and Social Assistance industry has the greatest number of employees in the County, with 27,097.

Figure 3-8 through Figure 3-10 show the distribution and exposure density of residential, commercial, and industrial buildings in Passaic County. Exposure density is the dollar value of structures per unit area, including building content value. The densities are shown in units of $1,000 ($K) per square mile. Viewing exposure distribution maps can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.

Figure 3-8. Distribution of Residential Building Stock and Value Density in Passaic County

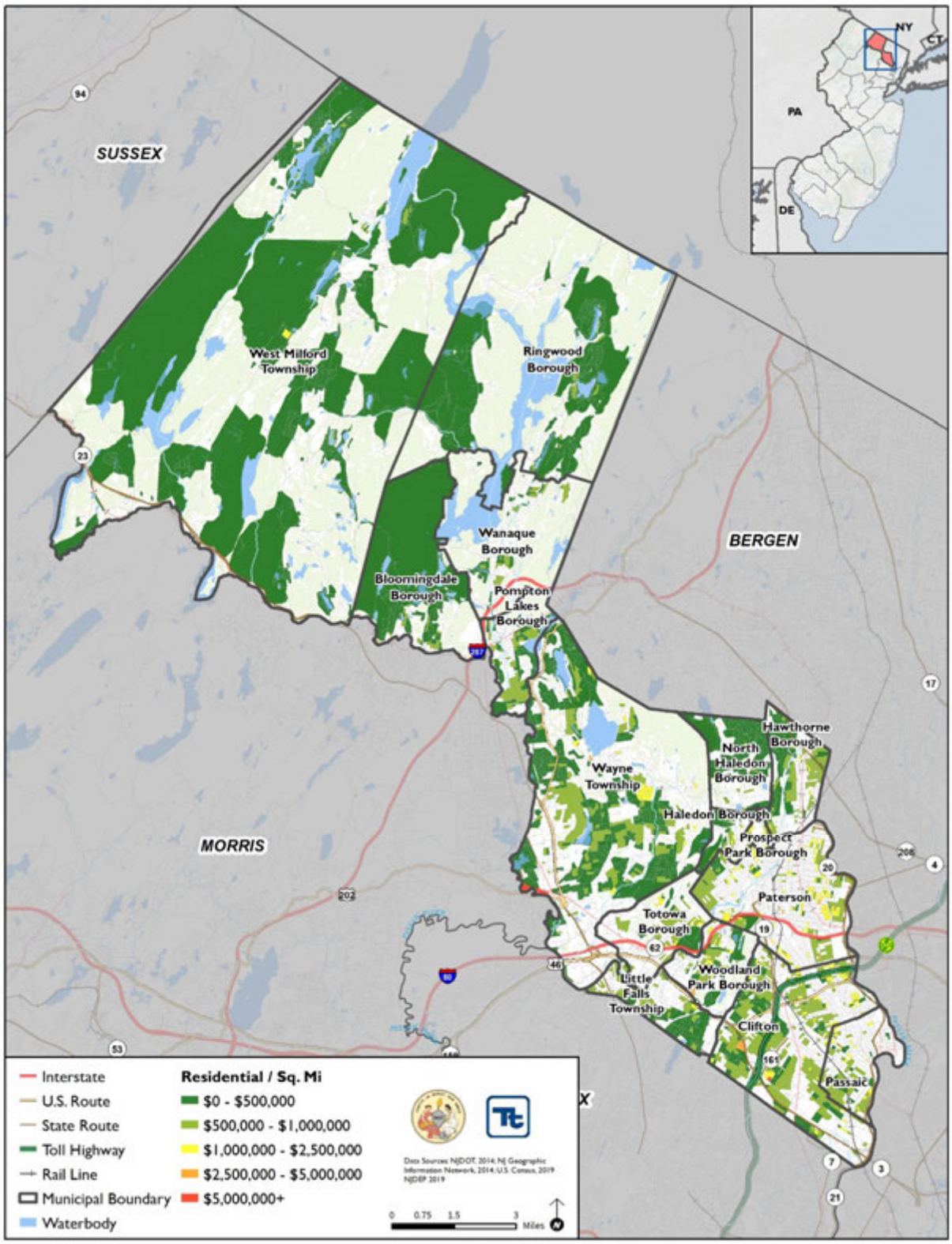


Figure 3-9. Distribution of Commercial Building Stock and Exposure Density in Passaic County

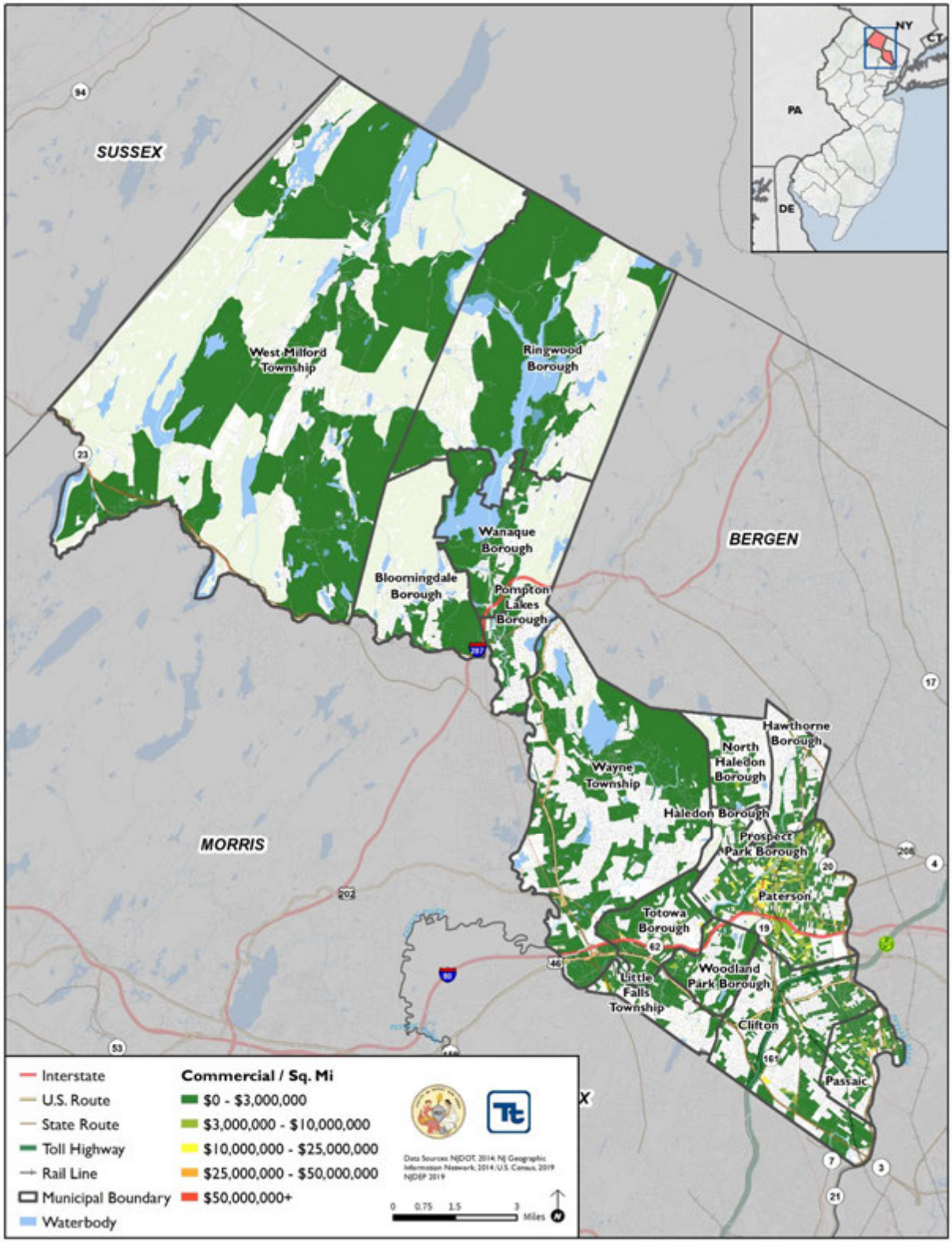
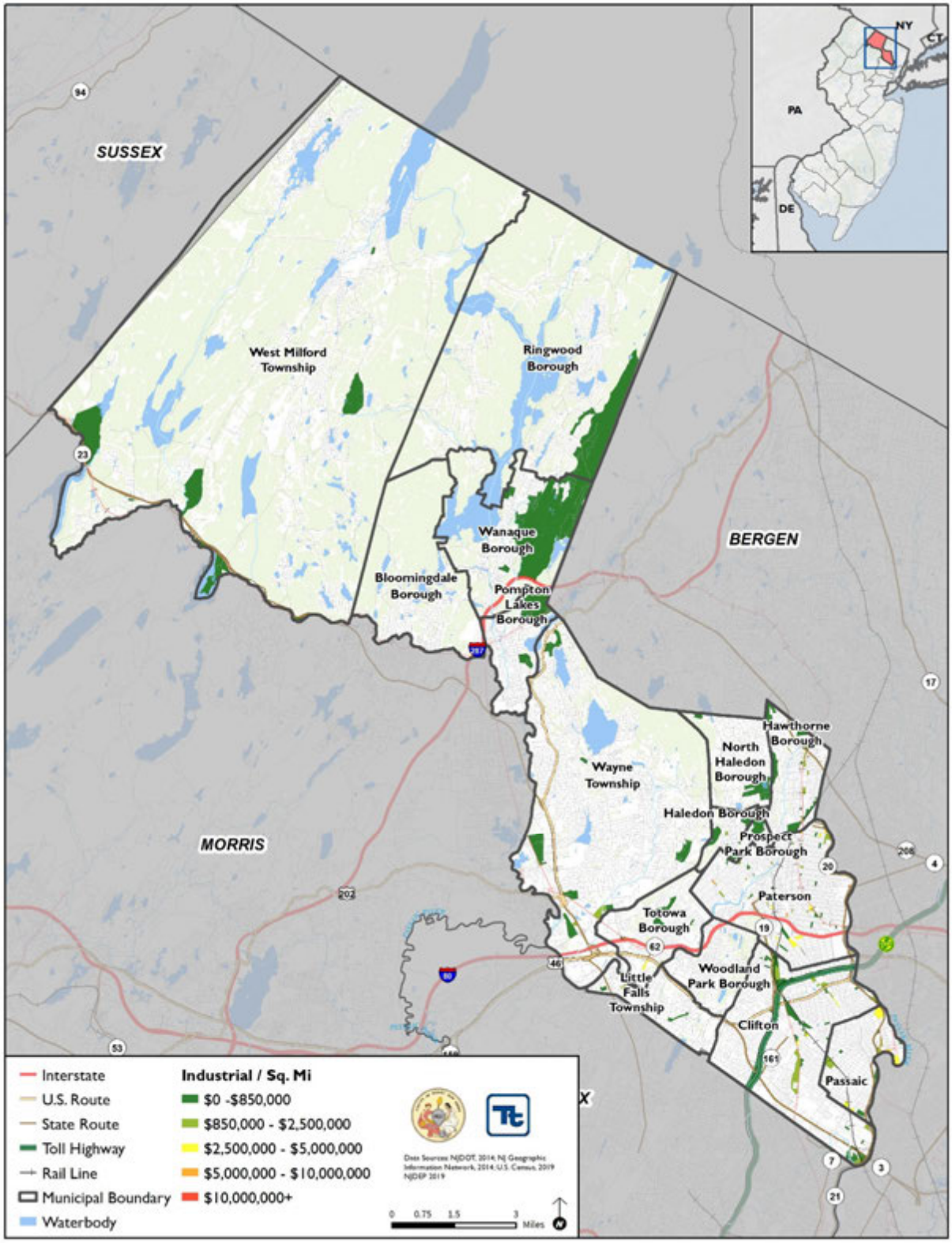


Figure 3-10. Distribution of Industrial Building Stock and Value Density in Passaic County



3.4 ECONOMY

As discussed in the FEMA Local Mitigation Handbook, after a natural hazard event, economic resiliency drives recovery. An understanding of the major employers and economic sectors in the County whose losses or inoperability would impact the community and its ability to recover from a disaster is essential. The following provides information regarding the economy in Passaic County.

Passaic County completed a Comprehensive Economic Development Strategy (CEDS) in 2015 that took place concurrent with the last HMP. The CEDS was organized by the identification of six primary goals and subsequent related actions and sub-tasks. The goals focused on elements of a vibrant community (i.e. natural resources, affordable housing, strong central cores, etc.). In addition, the County conducted Comprehensive Economic Impact Analysis of Hurricane Irene and Business Continuity Disaster Plans. Broadly, Passaic County suffered economically from both Hurricane Irene (2011) and Superstorm Sandy (2012). Those disasters not only caused physical damage to the County's assets but also reduced demand for commercial and residential property and overall business activity. In 2011, following Irene, Passaic County experienced $15 million in business losses and over $6 million in losses to real estate. In 2018, several years after Irene and Sandy, Passaic County had 12,408 private businesses and $7,294,039,000 (2012) total retail sales.

Passaic County has a varied business landscape, with both large corporate and small family-owned businesses (Passaic County Business Directory 2013). The County's legacy of entrepreneurship dates from the 18th century and ever since has actively encouraged business expansion and relocations into the community. Paterson was home to the Country's first planned industrial park, established by Alexander Hamilton who was then Secretary of the US Treasury. One of Passaic County's strongest assets is its transportation infrastructure: air, water, land, rail, and major roadways. The economy of Passaic County is highly diversified with no particular industry or sector accounting for a large percentage of the employment in the county. Passaic County's total labor force is 242,492 with a 3.9% unemployment rate (Federal Reserve Bank of St. Louis Economic Data September 2019). The largest industry sectors, in terms of employment are government (16% of all jobs), retail trade (14%), health care and social assistance (14%) and manufacturing (10%). Compared to 2004 data, the government and manufacturing industries both experienced a decline in the number of jobs, a decrease of 4% and 23% respectively. Retail trade as well as health care and social assistance both experienced an increase in the number of jobs; 4% and 15% respectively. The sectors with the highest employment concentration relative to the nation were management of companies and enterprises, retail trade, and manufacturing (Camoin Associates 2014). Passaic County's top employers are: #1: St. Joseph's Medical Center – Paterson, #2: William Paterson University, #3: BAE Systems, #4: Giant Tire Service, #5: Valley National Bancorp, #6: Cytec Industrial, Inc. (Economic Data and US Census Bureau June 2018).

From 2005-2015 the number of jobs in Passaic County declined by over 4%, which is higher than the four adjacent NJ counties (2.9%) and the state decline (1.6%). Since the recession, the County has experienced very little job recovery. In 2013, the unemployment rate in Passaic County was 9.9% although since rebounded to 3.9% by 2019. At the same time, the County's largest city (Paterson) has a much higher unemployment rate at 7.7%. Since 2013, the trajectory of number of establishments and jobs has been on a downward trend (YourEconomy.org 2019). Four economic sectors experienced a 20% reduction and include: construction, manufacturing, wholesale trade, and finance and insurance. The administrative and support and health care and social assistance sectors have shown the most growth, in terms of jobs, since 2004 (Camoin Associates 2014). The Passaic County Workforce Development Center (WDC) 2014-2016 Unified Workforce Investment Plan identified the following key industry sectors as areas where it will focus its efforts: a. healthcare & health (social services); b. hospitality, tourism, and retail; c. transportation, logistics, and distribution; d. advanced manufacturing; e. technology and entrepreneurship.

Major areas of employment in Passaic County include manufacturing; health care and social services; administrative and support; waste management and remediation services; and retail companies. Over 57% of the County's labor force is employed in these areas (Passaic County Business Directory 2013). The commercial and industrial parks located throughout the county provide expanding companies with opportunities for growth (Passaic County Planning & Economic Development 2015).

3.5 DEVELOPMENT TRENDS AND NEW DEVELOPMENT

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. The DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use and development trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

Local zoning and planning authority are provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. Refer to Sections 5 (Capability Assessment) and Section 9 (Jurisdictional Annexes) for further details on the planning and regulatory capabilities for the County and each municipality.

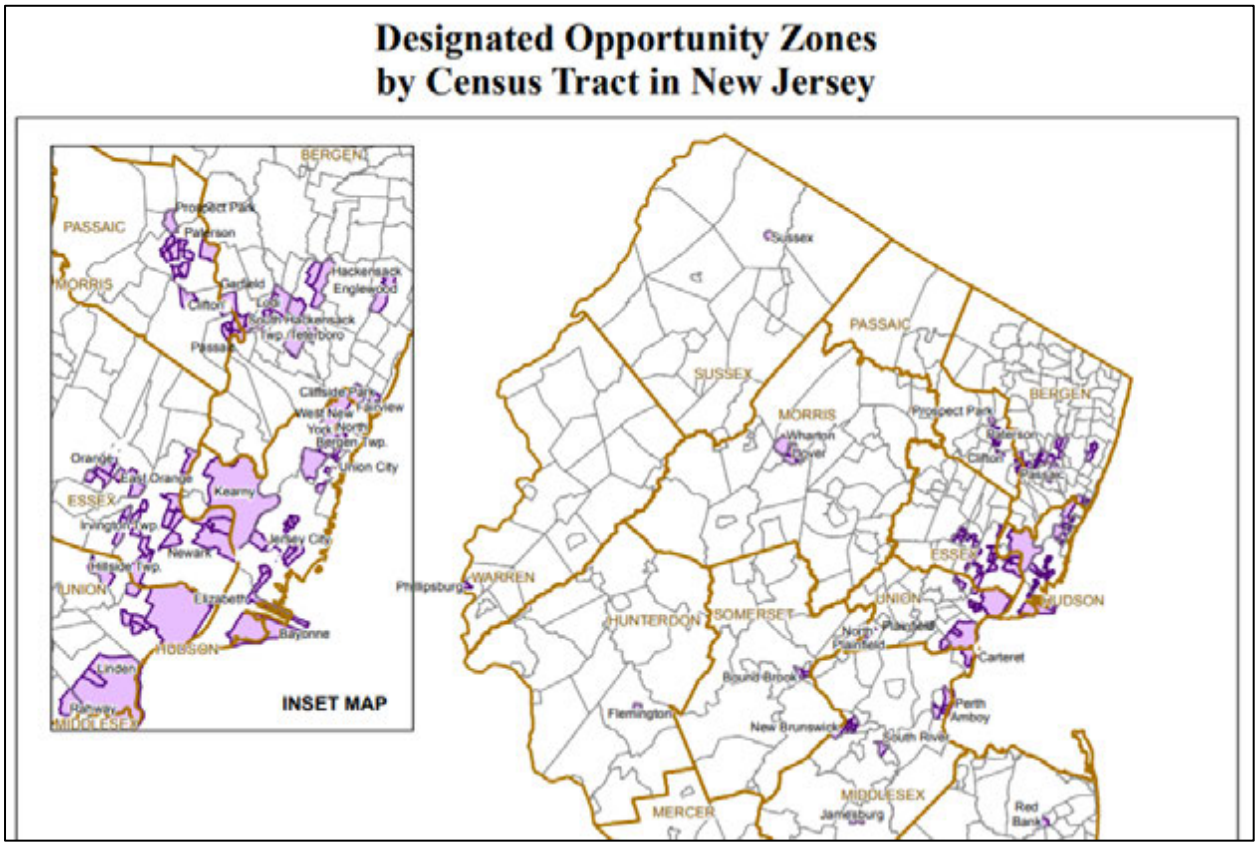
Passaic County is located partially in the New Jersey Highlands Region Preservation Area and partially in the Planning Area. The Highlands Region was officially formed in 2004 to support more regional approaches to land and water conservation, preservation, and management. The Region is found in New Jersey but also neighboring states of New York, Pennsylvania, and Connecticut. The County recognizes the unique value of the Highlands Area and seeks to protect and enhance it while ensuring that land use and development activities occur only in a manner and location that is consistent with the Highlands Regional Master Plan.

In the County, the Division of Economic Development initiates large-scale real estate development projects, promotes the redevelopment of brownfield sites, and encourages the creation of local partnerships between the Passaic County business community and residents. The 2015 CEDS identified the promotion of the use of technology to support economic development, including access to high-speed telecommunications, as one of seven primary goals of the CEDS. While Passaic County experienced the impacts of recent economic downturns and the Irene and Sandy disasters, the County's strength as a population center near New York City remains.

The sizable workforce, excellent mass transit options, and post-secondary educational institutions form a solid foundation upon which the County expects to build upon in the coming decades. Furthermore, the CEDS has identified six primary goals to facilitate the plan's framework to support the development of Passaic County as a vibrant community: 1. Maintain and improve infrastructure to support sustainable development; 2. Enhance Passaic County's image as "open for business"; 3. Prepare the county's workforce for present and future employment opportunities; 4. Support industry development through business attraction, retention, and expansion efforts; 5. Help communities and businesses prepare for and prevent losses from future major disaster events; 6. Improve sustainability and encourage brownfield redevelopment throughout the county (CEDS 2015). One action related to hazard mitigation, for example, is 5C – Work Regionally to Reduce Flooding. One related sub-task is to work with municipalities to reduce development in flood prone areas.

The Opportunity Zones program was enacted as part of the 2017 federal Tax Cuts and Jobs Act and is designed to drive long-term capital investments into low-income rural and urban communities. This federal program provides opportunities for private investors to support investments in distressed communities through participation in Qualified Opportunity Funds. The City of Paterson, City of Passaic, City of Clifton and Borough of Prospect Park contain Opportunity Zone areas; refer to Figure 3-11.

Figure 3-11. Opportunity Zones in Passaic County

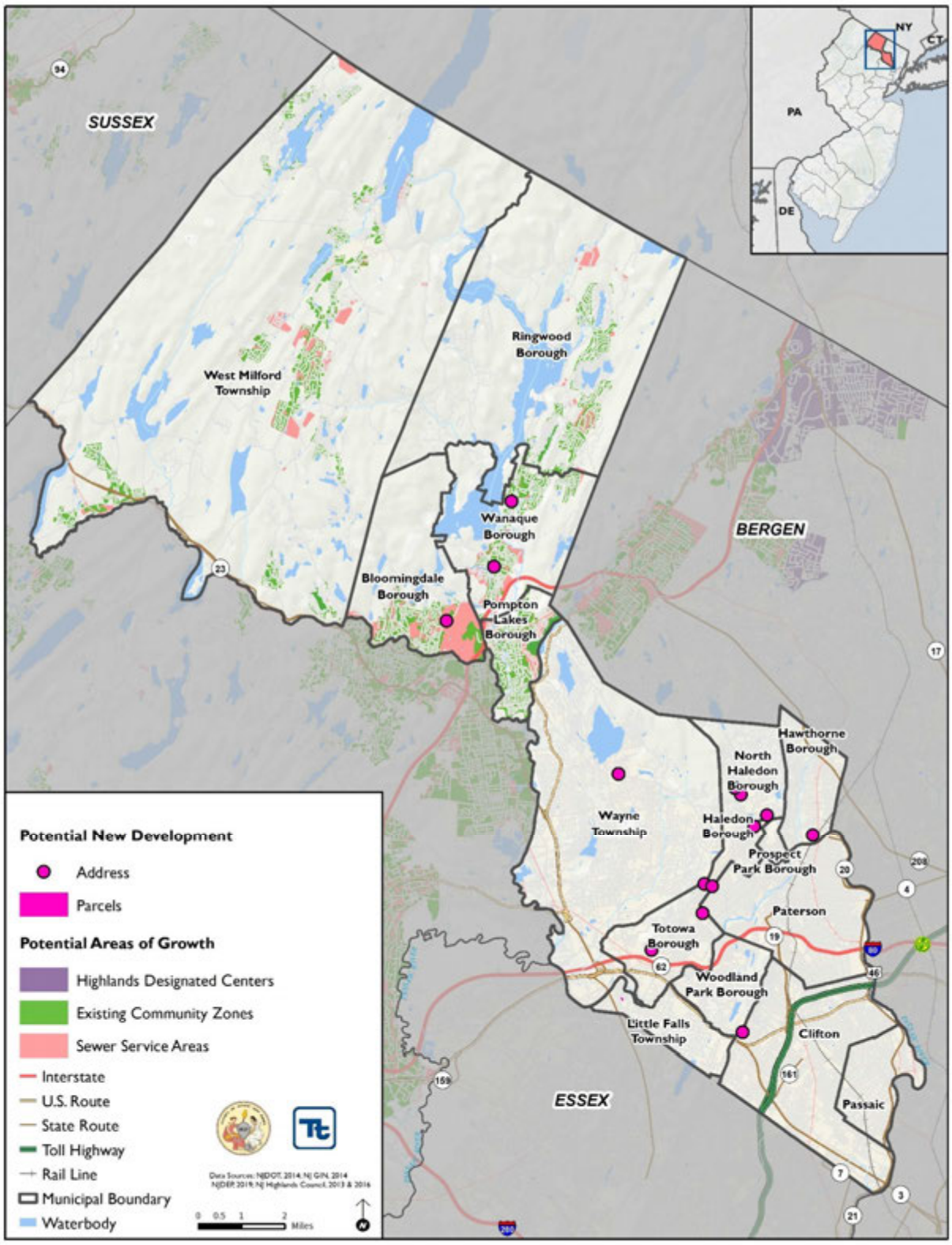


Source: NJ Department of Community Affairs 2020

The New Jersey Highlands Council has identified areas of existing development as well as areas of potential growth that may provide insight as to where potential new development may occur in Passaic County. These areas include the Existing Community Zone (both in-fill of new development and re-development) and Designated Centers; refer to Figure 3-12. The New Jersey Highlands Council assists with planning and considers hazard areas such as floodplains when evaluating new and re-development in the region. In addition, the NJDEP Sewer Service Areas are also show. These areas show the planned method of wastewater disposal for specific areas, i.e. whether the wastewater will be collected to a regional treatment facility or treated on site and disposed of through a surface water discharge of groundwater discharge.

New development that has occurred in the last five years within the County and potential future development in the next five years has been identified by each municipality. An exposure analysis was conducted to determine the relationship between the identified potential new development and natural hazard areas evaluated in the HMP update. The results of this spatial analysis have been reviewed with each jurisdiction and are documented in Table 9.X-2 in each jurisdiction annex. In addition, the summary of this analysis and hazard-specific maps are included at the end of each vulnerability assessment (Section 4 – Risk Assessment). Figure 3-12 illustrates the potential new development identified by each jurisdiction, as well as Highlands Existing Community Zones, Designated Centers and Sewer Service Areas which are areas of potential future growth in Passaic County.

Figure 3-12. Areas of Potential Growth and Development in Passaic County



3.6 CRITICAL FACILITIES AND LIFELINES

Critical facilities and infrastructure are necessary for a community's response to and recovery from natural hazard events. Critical facilities include essential facilities, transportation systems, lifeline utility systems, high potential loss facilities and hazardous material facilities. Transportation systems include roadways, bridges, airways, and waterways. Utility systems include potable water, wastewater, oil, natural gas, electric power facilities, and emergency communication systems.

A comprehensive inventory of critical facilities in Passaic County was developed from various sources including the Passaic County OEM, Passaic County Planning & Economic Development Department, and individual municipalities. This inventory is used for the risk assessment in Section 4.

Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster. As defined for this HMP, critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and hazardous material facilities.

A ***community lifeline***, a type of critical facility, enables the continuous operation of government functions and critical business and is essential to human health and safety or economic security.

An enhancement to the 2020 HMP was the identification of community lifelines across Passaic County. Passaic County's definition for a lifeline aligns with FEMA: "a type of critical facility that provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security." Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occurs; refer to Appendix E for the FEMA fact sheet on lifelines. Overall, of the 904 critical facilities in Passaic County, 397 were identified as community lifelines.

The inventory developed for the HMP update is considered sensitive information. It is protected by the Protected Critical Infrastructure Information (PCII) program and under New Jersey Executive Order 21. Therefore, individual facility names and addresses are not provided in this HMP. A summary of the facility types used for the risk assessment are presented further in this section.

3.6.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters, and senior care and living facilities. As stated above, these assets provide indispensable services that need to remain in operation before, during and after natural hazard events. Refer to Section 9 (Jurisdictional Annexes) for mitigation strategies identified by plan participants to reduce future impacts to vulnerable essential facilities and lifelines. Figure 3-13 illustrates the inventory of these essential facilities in Passaic County.

Essential facilities are a subset of critical facilities that include those facilities that are important to ensure a full recovery following the occurrence of a hazard event. For the County risk assessment, this category was defined to include police, fire, EMS, EOCs, schools, shelters, senior facilities and medical facilities.

Emergency Facilities are for the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC).

Emergency Facilities

For the purposes of this HMP, emergency facilities include police, fire, EMS and emergency operations centers (EOC). The County has a highly coordinated and interconnected network of emergency facilities and services at the County and municipal level. The Passaic County OEM serves as the primary coordinating agency between local, state, and federal agencies. In response to an emergency event, the Passaic County OEM will work with county and municipal health agencies and healthcare providers, emergency facilities and the County Sheriff's Office to provide aid to residents of the county.

Each municipality is responsible for maintaining its own police department, fire department, and EOC. However, the Boroughs of Bloomingdale, Haledon, and Prospect Park do not have their own EMS facility. The Borough of Bloomingdale utilizes the Tri-Boro First-Aid Squad located in Butler and the Boroughs of Haledon and Prospect utilize the City of Paterson's EMS.

Overall, there are 27 enforcement facilities, 115 fire and EMS facilities, and 19 EOCs in Passaic County.

Hospital and Medical Facilities

Passaic County has a dynamic health care industry that includes hospitals, adult day care centers, and long-term care facilities. There are three hospitals located in Passaic County and include: St. Joseph's Regional Medical Center in the City of Paterson, St. Joseph's Hospital (Kindred Hospital) in Wayne Township, and Saint Mary's General Hospital located in the City of Passaic.

Schools

More than 200 schools, ranging from elementary to post-secondary education, service the County. Schools can function as shelters in times of needs and are important resource for the community. Passaic County is home to several universities and colleges that provide a wide range of programs for students (Passaic County Business Directory 2013). These high education facilities include:

- ***William Paterson University*** is one of nine state colleges and universities in New Jersey. The campus is located in Wayne Township and comprises 370 wooded acres. The campus is located just 20 miles west of New York State. Approximately 10,500 students attend William Paterson University. The university offers 57 undergraduate and 22 graduate programs.
- ***Montclair State University*** is located amongst three municipalities (two are located in Passaic County) – Montclair (Essex County), Clifton (Passaic County) and Little Falls (Passaic County). It comprises

246 acres and has an enrollment of over 16,000 students. The university offers 250 undergraduate and graduate programs, and certificates.

- ***Passaic County Community College*** has several campuses across Passaic County in the Cities of Paterson and Passaic, the Borough of Wanaque, and the Township of Wayne. The College has 10,000 students and offers numerous programs.
- ***Berkeley College*** has seven campuses in the New York metropolitan area with one campus in Passaic County at Garrett Mountain in Woodland Park
(Passaic County Business Directory 2013).

There is a total of 247 education facilities located in the County.

Shelters

There were 53 shelters identified within the County; many of which are schools, community centers, and municipal buildings.

Senior Care and Living Facilities

It is important to identify and account for senior facilities, as they are highly vulnerable to the potential impacts of disasters. Understanding the location and numbers of these types of facilities can help manage effective response plan post disaster. There are 40 senior facilities located in the inventory for the risk assessment.

Government Buildings

In addition to the facilities discussed, other county and municipal buildings, and department of public works facilities are essential to the continuity of operations pre-, during and post-disasters.

3.6.2 Transportation Systems

One of the County's strongest assets is its transportation infrastructure. Air, water, land, and rail are available and major roadways include the Garden State Parkway, Interstates 80 and 287, and State Routes 3, 19, 20, 21, 23, 46, and 208 (Passaic County Economic Development 2013). There is one private airport in the County, and 28 bus and park and ride facilities. The New York, Susquehanna & Western Railway, New Jersey Transit and Norfolk Southern are the major railroads located within Passaic County; 10 rail facilities were identified that serve these railroads. Figure 3-14 illustrates the transportation facilities in Passaic County.

Figure 3-13. Essential Facilities in Passaic County

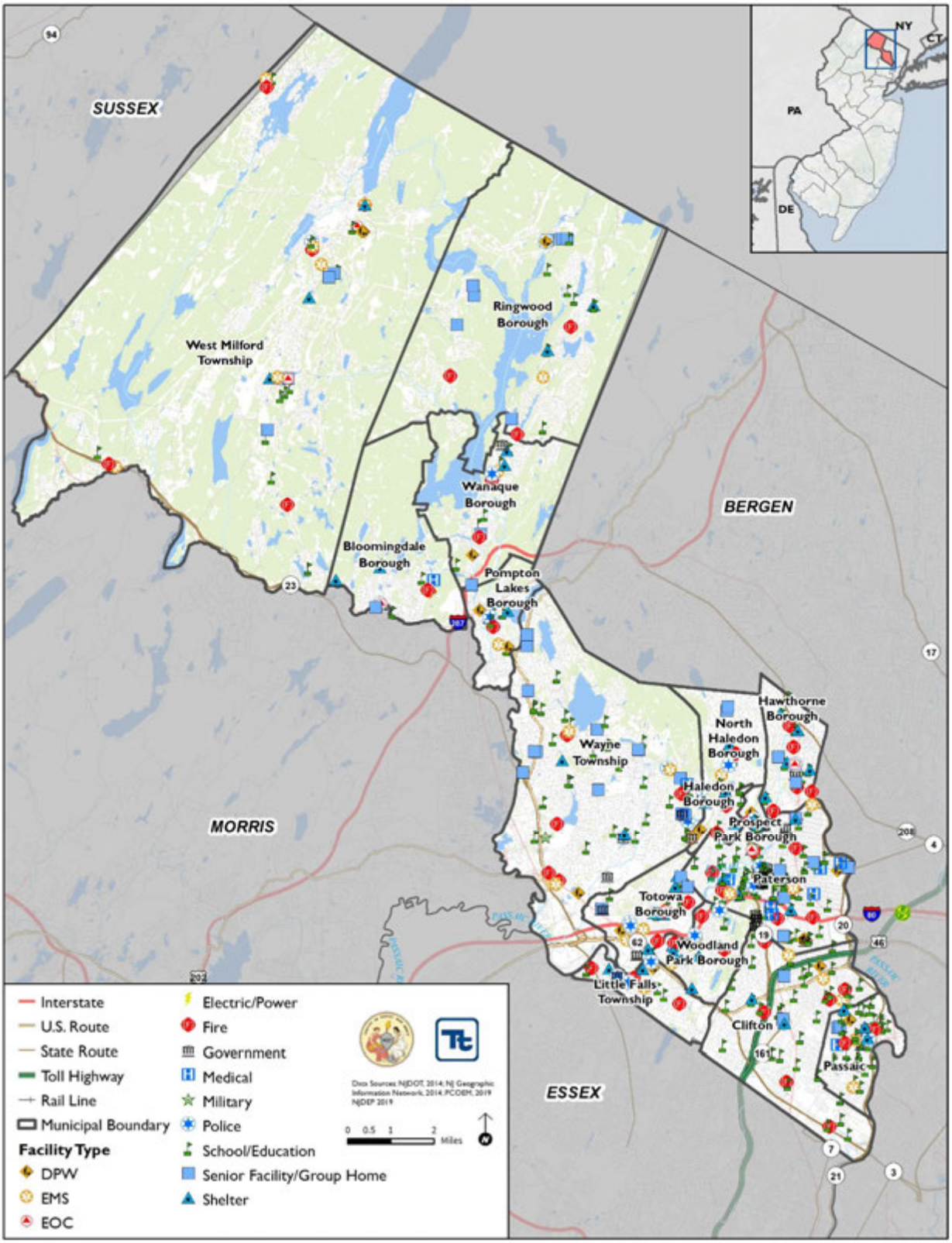
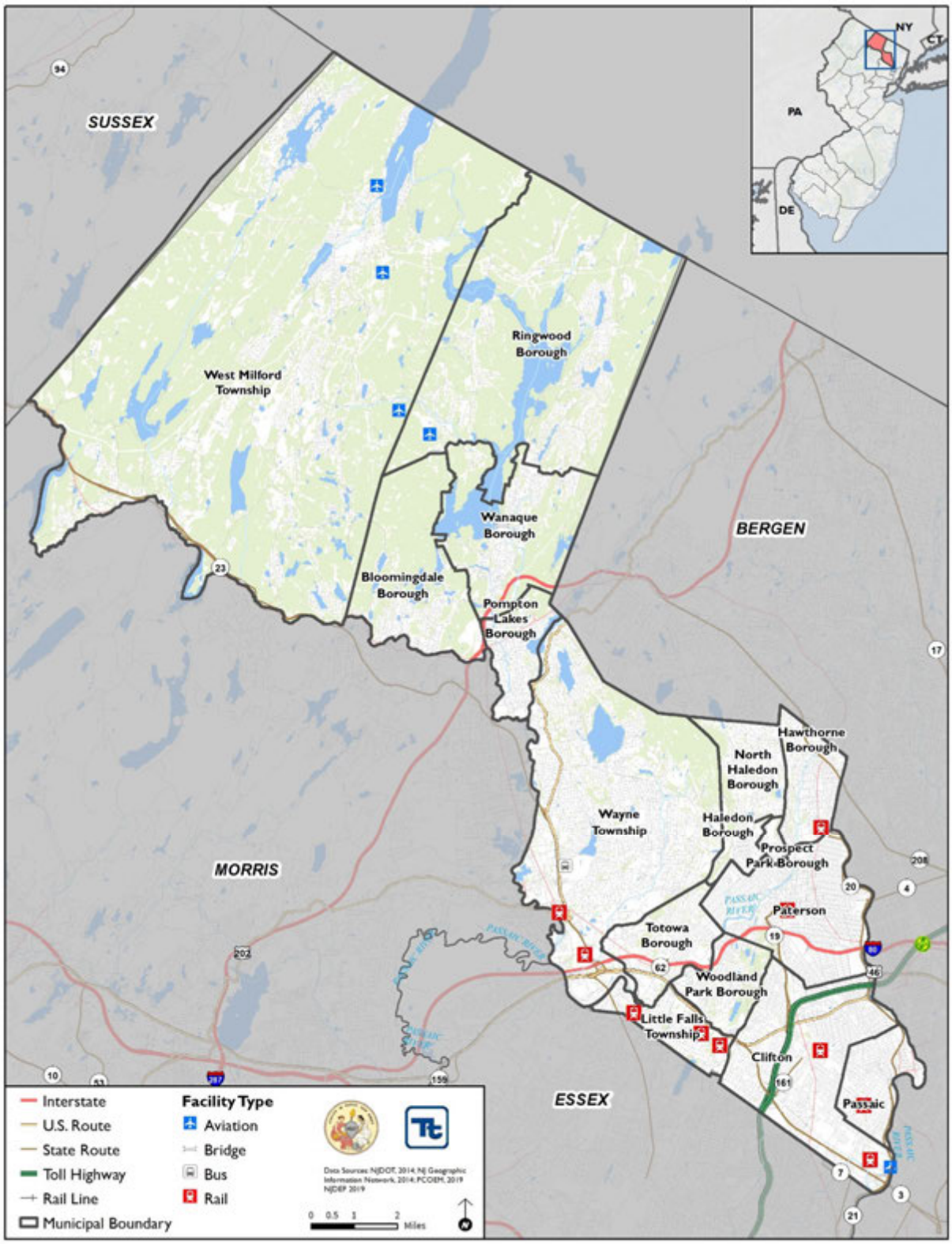


Figure 3-14. Transportation Facilities in Passaic County



3.6.3 Lifeline Utility Systems

This section presents communication, potable water, wastewater, and energy resource utility system data. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially been obtained.

Communication

Passaic County has a network of communication facilities such as utility towers, communication towers, stations, radio towers and cell towers. These facilities are controlled by both public and private institutions. Telecommunication providers in Passaic County include AT&T, Optimum, Sprint, and Verizon New Jersey (Passaic County Business Directory 2013). There are 12 essential communication facilities identified in the County.

Potable Water

In Passaic County, there are several ways in which water is supplied to the communities. The northern region of the County contains a large area of lakes and reservoirs, including the Wanaque and Monksville Reservoir, which provide water for communities. In addition, many communities rely on well water and private service providers, which includes the Passaic Valley Water Commission and United Water. Water suppliers in Passaic County include:

- Bloomingdale Water Company
- Butler Water
- Hawthorne Water Department
- American Water Resources
- North Jersey District Water Supply Commission
- Passaic Valley Water Commission
- Pompton Lakes Municipal Utilities Association
- Ringwood Water Department
- Totowa Water Department
- Wayne Township Division of Water and Sewer
- West Milford Township Municipal Utility Authority
- Woodland Park Water Department

(Passaic County Business Directory 2013)

There are 10 potable water treatment plants and 15 potable water pumps located within the County. Additionally, there were 80 wells for the risk assessment.

Wastewater Facilities

Several of the communities in the County provide local wastewater services, while others rely upon private providers, including the Passaic Valley Sewerage Commission, Wanaque Valley Regional Sewerage Authority and Wayne Township Division of Water and Sewer, for wastewater treatment (Passaic County Business Directory 2013). There are six wastewater treatment plants and 24 wastewater pump stations identified in the county.

Energy Resources

Public Service Electric and Gas (PSE&G) is the primary electric and gas utility company in Passaic County with Jersey Central Power and Light (JCP&L) and Orange & Rockland also providing electricity to the communities. Table 3-8 identifies the electric service providers to the municipalities of Passaic County. There are three electric

power generating facilities and 15 electric substations located within the county. There is one natural gas facility located in the county. Figure 3-15 illustrates the location of the utility lifelines in Passaic County.

Table 3-8. Electric Service Providers and Gas Facilities in Passaic County

Electric Service Provider	Municipalities Serviced
Algonquin Gas Transmission	Bloomingdale, Pompton Lakes, and Wanaque
Butler Electric	Bloomingdale and West Milford
First Energy Corp./JCP&L	Bloomingdale, Pompton Lakes, Ringwood, Wanaque, Wayne, and West Milford
Orange & Rockland	West Milford and Ringwood
PSE&G	Clifton, Haledon, Hawthorne, Little Falls, North Haledon, Passaic, Paterson, Pompton Lakes, Prospect Park, Totowa, Wayne, and West Paterson
Tennessee Gas Transmission Pipeline	Ringwood and West Milford
Texas Eastern Gas Pipeline	Bloomingdale, Pompton Lakes, and Wanaque
Transcontinental Gas Pipeline (Transco Energy)	Clifton and Little Falls

Source: Passaic County Business Directory 2013
JCP&L Jersey Central Power and Light
PSE&G Public Service Electric and Gas

3.6.4 High-Potential Loss Facilities

High-potential loss facilities include dams, levees, chemical facilities, nuclear power plants and military installations. There are no nuclear facilities located in Passaic County. Figure 3-16 displays the general locations of these facilities in the County. Dams are discussed below.

Pursuant to the NJDEP Regulations set at N.J.A.C. 7:20-1.8, there are four hazard classifications of dams in New Jersey. The classifications relate to the potential for property damage and/or loss of life should the dam fail:

- Class I (High-Hazard Potential) - Failure of the dam may result in probable loss of life and/or extensive property damage
- Class II (Significant-Hazard Potential) - Failure of the dam may result in significant property damage; however, loss of life is not envisioned
- Class III (Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life and/or significant property damage
- Class IV (Small-Dam Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life or significant property damage

According to the NJDEP Bureau of Dam Safety, there are 155 dams located in Passaic County, 49 of which are classified with a high-hazard potential.

3.6.5 Other Facilities

The Planning Committee identified additional facilities (user-defined facilities) as critical. These facilities include, one agricultural facility, 17 correctional facilities, three libraries, 22 facilities classified as farmland or parks and open space, seven historic sites, and 23 parking facilities. Figure 3-17 illustrates the general locations of these facilities in the County.

Figure 3-15. Utility Lifelines in Passaic County

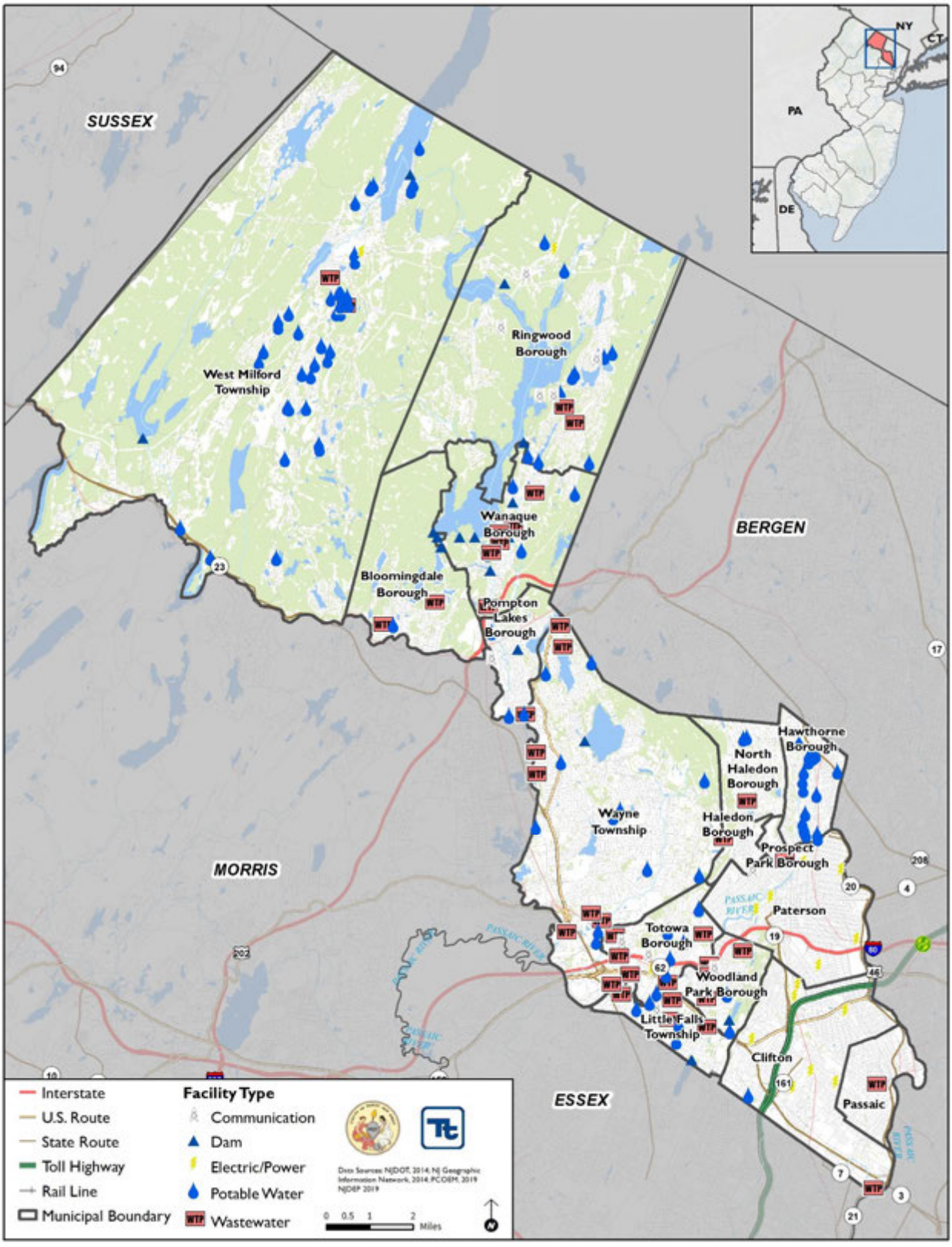


Figure 3-16. High-Potential Loss Facilities in Passaic County

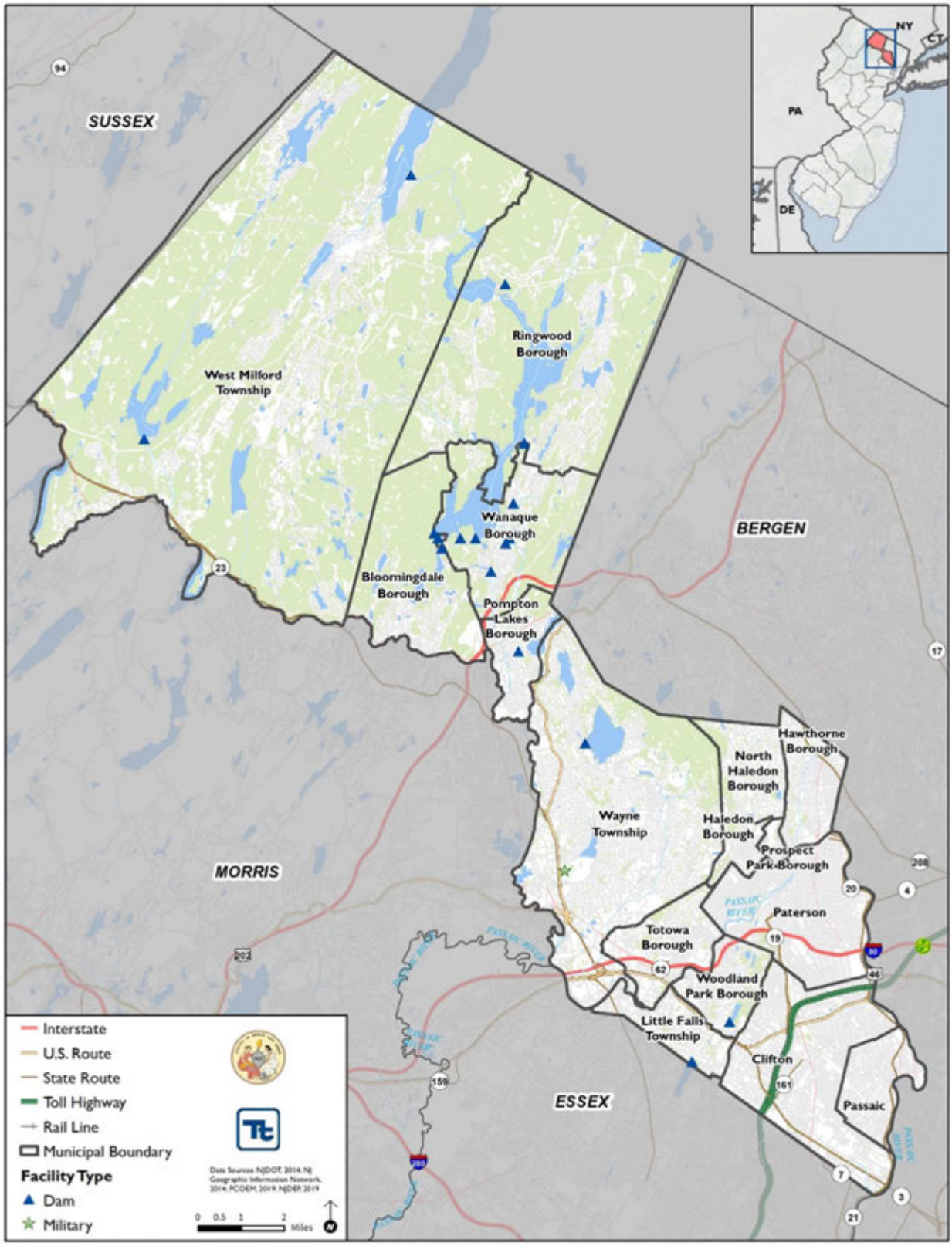
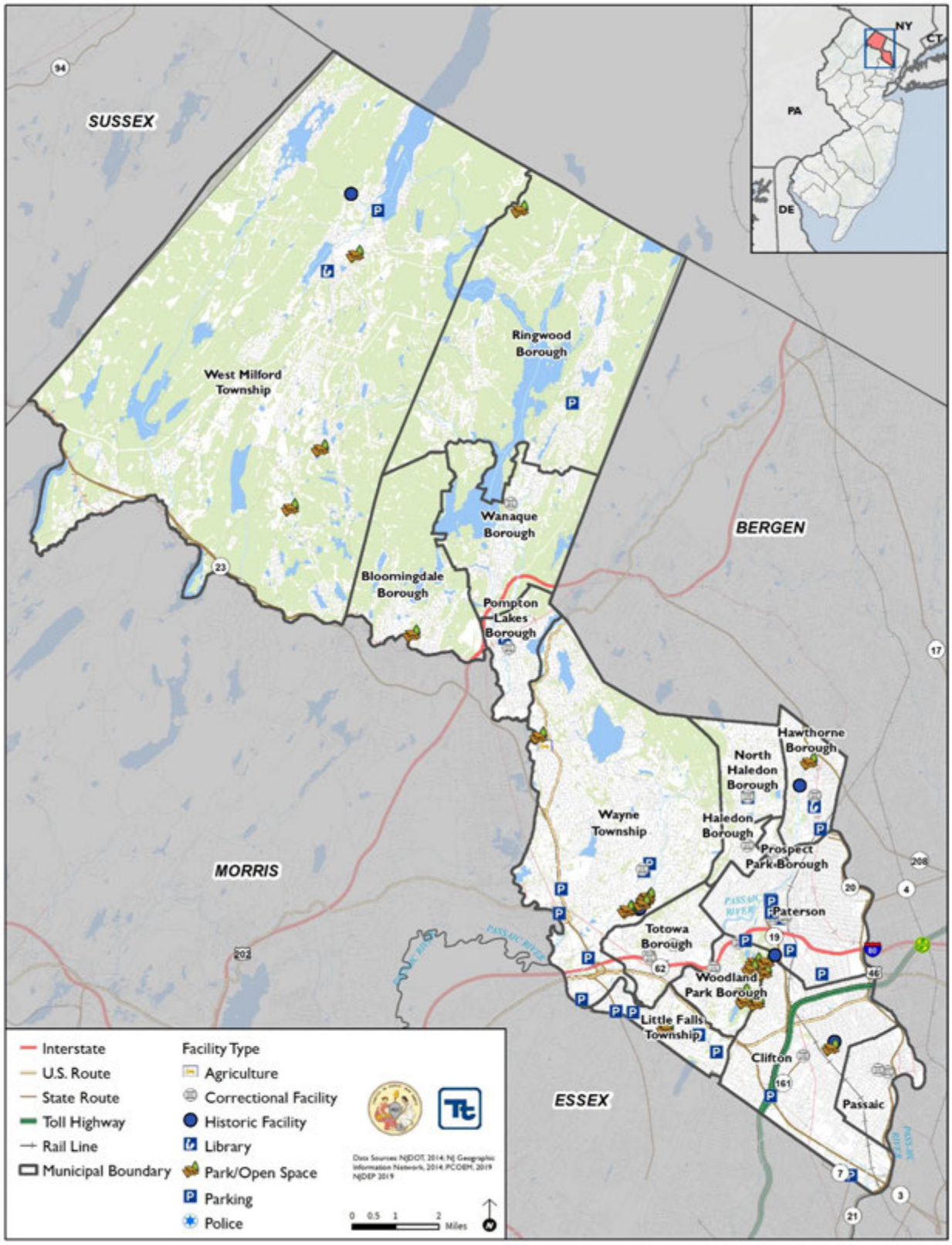


Figure 3-17. Additional Critical Facilities in Passaic County



SECTION 4. RISK ASSESSMENT

A risk assessment is the process of measuring the potential loss of life, personal injury, economic and property damage resulting from identified hazards. It allows planning personnel to address and reduce hazard impacts and emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. Results of the risk assessment are used to inform mitigation planning processes, including determining and prioritizing mitigation actions that reduce a community's risk to a specified hazard. Past, present, and future conditions must be evaluated to most accurately assess risk for each jurisdiction. The Passaic County risk assessment presented in Section 4 and outlined as follows:

- Identification of hazards of concern that impact Passaic County
- Methodology and tools used to conduct the risk assessment
- Hazards of concern profiles and vulnerability assessment
- Hazard ranking

4.1 IDENTIFICATION OF HAZARDS OF CONCERN

2020 HMP Changes

- The 2015 HMP 'Hazard Identification' was presented in subsection 5.2. For the 2020 HMP update, it is presented in subsection 4.1 (Identification of Hazards of Concern).
- The 2020 HMP flood hazard includes more discussion of urban flooding and a new hazard of concern: infestation and invasive species.

Hazards of Concern are defined as those hazards that are considered most likely to impact a community. These are identified using available data and local knowledge.

To provide a strong foundation for mitigation strategies considered in Section 6 (Mitigation Strategy), Passaic County considered a full range of natural hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The natural hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the State of New Jersey Hazard Mitigation Plan (NJ HMP) and previous hazard identification efforts; research and local, state, and federal information on the frequency, magnitude, and costs associated with the various hazards that have previously, or could feasibly, impact the region; and qualitative or anecdotal information regarding natural hazards and the perceived vulnerability of the study area's assets to them. Table 4.1-1 documents the process of identifying the natural hazards of concern for further profiling and evaluation.

For the purposes of this planning effort, the Planning Partnership chose to group some natural hazards together, based on the similarity of hazard events, their typical concurrence or their impacts, consideration of how hazards have been grouped in FEMA guidance documents (FEMA 386-1, "Understanding Your Risks, Identifying Hazards and Estimating Losses; FEMA's "Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy"), and consideration of hazard grouping in the NJ HMP. With the exception of hazardous substance release (fixed and in-transit), Passaic County chose to focus on natural hazards in this plan as non-natural hazards (technological and intentional hazards) are covered in other local and State plans.

Table 4.1-1. Identification of Natural Hazards of Concern for Passaic County

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Avalanche	No	No	• The NJ HMP does not identify avalanche as a hazard of concern for New Jersey. • The topography and climate of Passaic County does not support the occurrence of an avalanche event. • New Jersey in general has a very low occurrence of avalanche events based on statistics provided by the American Avalanche Association (AAA) between 1950 and 2014.	• NJ HMP • Review of NAC-AAA database • Steering and Planning Committee Input
Coastal Erosion	No	No	• The NJ HMP identifies coastal erosion as a hazard of concern for New Jersey. Counties bounded by coastal waters are most affected by coastal erosion. • Passaic County is not located in the Coastal Erosion Hazard Area (CEHA) however, there are tidal waters that may cause erosion along the Passaic River. This hazard is discussed in coastal storm.	• NJ HMP • NOAA • Steering and Planning Committee Input
Coastal Storm	Yes	Yes	• The NJ HMP identifies hurricanes/tropical storms and nor'easters as hazards of concern for New Jersey. • Due to its proximity to the Atlantic Ocean, Passaic County is susceptible to hurricanes, tropical storms, and Nor'Easters. • Between 2015 and 2019, Passaic County was included in one FEMA declarations related to coastal storms: March 6-7, 2018 – FEMA-DR-4368 – Severe Winter Storm and Snowstorm • Between 1842 and 2019, 31 tropical cyclones tracked within 65 nautical miles of Passaic County.	• NJ HMP • FEMA • NOAA • NOAA-NCDC Storm Database • Steering and Planning Committee Input
Dam Failure	Yes	Yes	• The NJ HMP identifies dam failure as a hazard of concern for New Jersey. • According to NJDEP, Passaic County has 49 high hazard dams, 23 significant hazard dams, and 61 low hazard dams. • Hurricane Floyd in 1999 resulted in significant damage to several dams in West Milford, Passaic County.	• NJ HMP • NJ DEP • Steering and Planning Committee Input
Disease Outbreak	Yes	Yes	• The NJ HMP identifies pandemic as a hazard of concern for New Jersey. • According to the NJ HMP, New Jersey's geographic and demographic characteristics make it particularly vulnerable to importation and spread of infectious diseases. All 21 counties in New Jersey have experienced the effects of a pandemic or disease outbreak. • Passaic County has been impacted by mosquito and tick-borne diseases, food-borne illness and most recently the COVID-19 pandemic. • Passaic County was part of a statewide emergency declaration for West Nile Virus in 2000 (EM-3156) and the DR-4488/EM-3451 for COVID-19.	• NJ HMP • FEMA • Steering and Planning Committee Input

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Drought	Yes	Yes	• The NJ HMP identifies drought as a hazard of concern for New Jersey. • The drought hazard is a concern for Passaic County because the County's water is supplied by both surface water and groundwater. Surface water supplies are affected more quickly during droughts than groundwater sources. • The USDA has declared disasters for Passaic County in 2012 (drought and excessive heat); 2014 (drought) and 2015 (excessive heat and drought).	• NJ HMP • USGS • NRCC • NOAA • NOAA-NCEI Storm Database • Steering and Planning Committee Input
Earthquake	Yes	Yes	• The NJ HMP identifies earthquake as a hazard of concern for New Jersey. Although they are known to occur on a regular basis, records indicate that no major earthquakes have struck the state since the establishment of historical record-keeping (1500's). • Passaic County is located in the Highlands and Piedmont Physiographic Provinces and near the Ramapo Fault line. • Since 2014, there have been 14 earthquakes with epi-centers in Passaic County. The January 2016 event had the greatest magnitude of 2.1 with the epi-center located in the Borough of Ringwood.	• NJ HMP • NJDEP • NJGS • Steering and Planning Committee Input
Expansive Soils	No	No	• The NJ HMP does identify expansive soils as a hazard of concern for New Jersey; however, the Planning Committee did not identify this as a hazard of concern for Passaic County. • Soils that expand (swell) as they become wet and contract (shrink) as they dry are called expansive soils. This change can cause the ground to move up and down several inches during a cycle of wetting and drying. Expansive soils that are predominately clay minerals have the ability to absorb water. • Passaic County soils have slight to moderate swelling potential and in some areas, contain little or no swelling clay. Based on the soil type and no history of expansive soil incidence occurring in the county, expansive soils are not a hazard of concern for Passaic County.	• NJ HMP • USGS 1989 Swelling Clays Map of the Conterminous U.S. • Steering and Planning Committee Input
Extreme Temperature	Yes	Yes	• The NJ HMP identifies extreme temperature as a hazard of concern for New Jersey as a type of severe weather. • Passaic County has experienced excessive heat and extreme cold temperature events. • The USDA declared disasters for excessive heat most recently in 2015; and frost/freezing in 2012. • Passaic County was included in a FEMA declaration DR-4369 in March 2018 for a severe winter storm and snowstorm that was accompanied by freezing temperatures.	• NJ HMP • NOAA – NCEI Storm Database • ONJSC • Steering and Planning Committee Input

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Flood (Riverine, Flash Flooding, Urban Flooding and Sea Level Rise)	Yes	Yes	• The NJ HMP identifies flooding as a hazard of concern in New Jersey. • The County has 3,438 NFIP policies and 6,228 Write-Your-Own policies. • There has been a total of over $111 million paid claims in Passaic County. • There are 1,748 repetitive and severe repetitive loss properties in the County. • The 2020 FEMA DFIRMs indicate over 12.5% of the County is located in the 1-percent annual chance floodplain; and greater than 15% of the County is located in the 0.2-percent annual chance floodplain.	• NJ HMP • FEMA • FEMA FIS • NFIP • NOAA-NCEI Storm Database • Steering and Planning Committee Input
Geological Hazards	Yes	Yes	• The NJ HMP identifies geological hazards as a hazard of concern for New Jersey. • There have been historic debris flow, rockfall and rockslide landslide events in Passaic County. • Carbonate rock formations are found in the northern portion of the County which are susceptible to natural subsidence. • The northwestern half of Passaic County contains numerous abandoned magnetite mines and one graphite mine. • Between January 2015 and May 2019, there have been no identified geological hazard events in Passaic County.	• NJHMP • NJGWS • NJDEP • Steering and Planning Committee Input
Hailstorm	Yes	Yes	Please see Severe Storm	
Hurricane (and other Tropical Cyclones)	Yes	Yes	Please see Coastal Storm	
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation and Invasive Species	Yes	Yes	• Passaic County has a diverse landscape with development woven through natural areas. • Pests in Passaic County that compete for natural resources or transmit diseases to humans, livestock and the environment include insects and invasive plants. • Due to the large forested area in the northern portion of the County and the abundance of parkland throughout, Emerald Ash Borer (EAB) and other pests that damage trees have become an increased focus. Passaic County has removed over 200 ash trees to date infested by EAB. • Passaic County has experienced harmful algal blooms in the past causing impacts to natural systems and the local economy. • Infestation and invasive species has been added as a new hazard of concern to the 2020 HMP update.	• Steering and Planning Committee Input
Land Subsidence	Yes	No	Please see Geological Hazards	

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Landslide	Yes	No	Please see Geological Hazards	
Nor'Easters	Yes	Yes	Please see Severe Storm and Severe Winter Storm	

Radon	Yes	No	• Pompton Lakes and West Milford County are located in what the State has identified as Tier 1 with buildings susceptible to high concentrations of the gas: https://www.njradon.org/radonin.htm
			  ○ Revised building code requires radon control measures be installed for new construction
			  ○ Testing is required at time of real estate transaction;
			  ○ Municipalities and County already conduct education and outreach on this hazard:
			  ▪ Pompon Lakes (Jan 2019) announced participation in radon awareness program: http://www.pomptonlakes-nj.gov/CivicAlerts.aspx?AID=86&ARC=165
			  ▪ West Milford has Radon Action Month: http://www.westmilford.org/cn/news/archnews.cfm?NID=4968&TID=11&jump2=0
			  ▪ County Department of Health has offered free radon testing kits: https://www.northjersey.com/story/news/morris/butler/2016/11/06/passaic-county-offering-free-radon-test-kits-for-homeowners/93541366/
			  ▪ Freeholders continue to pass resolution to participate in the New Jersey Radon Awareness campaign year after year
			  • 2018: http://www.passaiccountynj.org/Sept%2025%202018.pdf
			  • 2016: http://www.passaiccountynj.org/2016%20meeting%20minutes%20FH/mar%2022%202016.pdf
			  • 2012: http://www.passaiccountynj.org/October%2023,%202012.pdf
			  ▪ West Milford has advertised for this as well: http://www.westmilfordmessenger.com/news/local-news/passaic-county-initiates-radon-awareness-program-ABWM20161104161109972
			• This hazard was not evaluated further in the 2020 HMP.
				• NJDEP: https://www.njradon.org/radonin.htm

Severe Storm (Windstorms, Thunderstorms, Hail, Lightning, and Tornados)	Yes	Yes	• The NJ HMP identifies severe weather as a hazard of concern for New Jersey. • Severe weather events occur annually in Passaic County causing a range of impacts from property damage, flooding and loss of power. • NOAA's NCEI storm events database indicates that Passaic County was impacted by approximately 16 severe storm events between June 2014 and July	• NJ HMP • NOAA – NCEI • FEMA • NJ OEM • Steering and Planning

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			2019. • The strongest tornado on record in Passaic County was an F-1.	Committee Input
Severe Winter Storm (Heavy Snow, Blizzards, Freezing Rain/Sleet, Ice Storms)	Yes	Yes	• The NJ HMP identifies severe winter weather as a hazard of concern for New Jersey. • Normal seasonal snowfall in Passaic County ranges between 25-35 inches. • Between 2015 and 2019, Passaic County was included in one FEMA declaration related to severe winter weather: March 6-7, 2018 – FEMA-DR-4368 – Severe Winter Storm and Snowstorm • NOAA-NCDC has indicated that Passaic County has experienced the impacts of several winter storm events between January 2015 and May 2019.	• NJ HMP • FEMA • NOAA – NCEI Storm Database • ONJSC • Steering and Planning Committee Input
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	• The NJ HMP does identify tsunami as a hazard of concern for New Jersey. • None of Passaic County is bounded by coastal waters; therefore, tsunami is not identified as a hazard of concern by Passaic County.	• NJ HMP • Steering and Planning Committee Input
Volcano	No	No	• The NJ HMP does not identify volcano as a hazard of concern for New Jersey.	• NJ HMP
Wildfire	Yes	Yes	• The NJHMP identifies as wildfire as a hazard of concern for New Jersey. • In Passaic County, greater than 10 square miles are located in the extreme and very high wildfire fuel zones according to the New Jersey Forest Fires Service. • Between January 2015 and May 2019, there have no reports of wildfires in Passaic County that could not be controlled by State and local fire services. However, based on input from the Planning Committee, wildfire is considered a hazard of concern for Passaic County due to the large areas of State forests and development proximate to these areas.	• NOAA – NCEI Storm Events Query • USGS • NJ HMP • NJFFS • Steering and Planning Committee Input
Windstorm	Yes	Yes	Please see Severe Storm	

DIR	*Drought Impact Reporter*	*NJDOH*	*New Jersey Department of Health*
DR	*Presidential Disaster Declaration Number*	*NJFFS*	*New Jersey Forest Fire Service*
EM	*Presidential Disaster Emergency Number*	*NJGS*	*New Jersey Geological Survey (as part of the NJDEP)*
FEMA	*Federal Emergency Management Agency*	*NOAA*	*National Oceanic and Atmospheric Administration*
HMP	*Hazard Mitigation Plan*	*NRCC*	*Northeast Regional Climate Center*
K	*Thousands ($)*	*NWS*	*National Weather Service*
M	*Millions ($)*	*OEM*	*Office of Emergency Management*
NCDC	*National Oceanic and Atmospheric Administration National Climatic Data Center*	*ONJSC*	*Office of New Jersey State Climatologist*
		SPC	*Storm Prediction Center*
NJ	*New Jersey*	*USGS*	*U.S. Geologic Survey*
NJDEP	*New Jersey Department of Environmental Protection*		

Table 4.1-2. Identification of Non-Natural Hazards of Concern for Passaic County

Hazard	Is this a hazard that may occur in Passaic County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Hazardous Substances	Yes	Yes	• The NJ HMP identifies hazardous substances as a hazard of concern for New Jersey. • Major highways that traverse Passaic County with vehicles that may transport hazardous materials include I-287, I-80 and the Garden State Parkway. • Hazardous substances may also be transported via rail or pipeline in the County. • Between 2014 and 2018, Passaic County had a total of 123,714.8 pounds of chemicals released on-site and a total of 155,659.22 pounds of chemicals released off-site (USEPA 2020). • The Planning Committee identified hazardous substances as a hazard of concern for Passaic County due to its extensive transportation network and vulnerability.	• NJ HMP • NJ.com • US EPA • PHMSA • Steering and Planning Committee Input

NJ HMP *New Jersey Hazard Mitigation Plan*
PHMSA *Pipeline and Hazardous Materials Safety Administration*
USEPA *United States Environmental Protection Agency*

According to input from the County, and review of all available resources, a total of 12 natural hazards and one human-caused hazards of concern were identified as significant hazards affecting the entire planning area, to be addressed at the county level in this plan:

Natural Hazards of Concern

- Coastal Storm
- Dam Failure
- Disease Outbreak
- Drought
- Earthquake
- Extreme Temperature
- Flood (including riverine, flash, sea level rise, urban flooding)
- Geological Hazards (landslide, subsidence, and sinkholes)
- Infestation and Invasive Species
- Severe Weather (High Winds, Tornadoes, Thunderstorms, Hail)
- Severe Winter Storm (Heavy Snow, Blizzards, Ice Storms)
- Wildfire

Human-Caused Hazards of Concern

- Hazardous Materials (Fixed Sites and Transportation)

Other natural and human-caused hazards of concern have occurred within Passaic County, have a low potential to occur and/or result in significant impacts within the County, or are covered in other plans that specifically address technological and intentional hazards. Therefore, these hazards will not be further addressed within this version of the plan. However, if deemed necessary by the County, these hazards may be considered in future versions of the HMP.

4.2 METHODOLOGY AND TOOLS

2020 HMP Changes

- The risk assessment was updated using best available information.
  - Hazard events and associated impacts were researched and summarized from 2014 to 2019
  - 2013-2017 American Community Survey 5-year estimates were utilized
  - Building footprints from the Microsoft Bing 2018 footprint dataset and 2019 Open Street Map dataset, updated parcels from the 2018 MODIV tax assessor dataset, and RS Means 2019-dollar values were used to develop a structure-level building inventory and estimate replacement cost value for each building.
  - The 2015 critical facility was reviewed and updated by the Planning Partnership.
  - Lifelines were identified in the critical facility inventory to align with FEMA's lifeline definition.
  - HAZUS-MH v4.2 was used to estimate potential impacts to the flood, wind and seismic hazards.
  - Best available hazard data was used as described in this section.

The following summarizes the asset inventories, methodology and tools used to support the risk assessment process.

4.2.1 Asset Inventories

Passaic County assets were identified to assess potential exposure and loss associated with the hazards of concern. For the HMP update, Passaic County assessed exposure vulnerability of the following types of assets: population, buildings and critical facilities/infrastructure and the environment. Some assets may be more vulnerable because of their physical characteristics or socioeconomic uses. To protect individual privacy and the security of critical facilities, information on properties assessed is presented in aggregate, without details about specific individual personal or public properties.

The risk assessment included the collection and use of an expanded and enhanced asset inventory to estimate hazard exposure and vulnerability.

Population

Total population statistics from the 2013-2017 American Community Survey 5-year estimate were used to estimate the exposure and potential impacts to the County's population in place of the 2010 U.S. Census block estimates. Population counts at the Census tract level were averaged among the residential structures in the County to estimate the population at the structure level. This estimate is a more precise distribution of population across the County compared to only using the Census block or Census tract boundaries. Limitations of these analyses are recognized, and thus the results are used only to provide a general estimate for planning purposes.

As discussed in Section 3 (County Profile), research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Passaic County included in the risk assessment are children, elderly, and population below the poverty level.

Buildings

The building stock inventory was updated countywide. To develop the building inventory, parcels from the 2018 MODIV tax assessor data obtained from the New Jersey Geographic Information Network Open Data portal and Microsoft Bing 2018 building footprints were used. Building footprints were supplemented with the 2019 Open Street Map dataset where gaps existed. Attributes provided in the spatial files were used to further define each structure in terms of occupancy class, construction type, etc. Default information was used to fill in the gaps for building attributes. The centroid of each building footprint was used to estimate the building location. Structural and content replacement cost values (RCV) were calculated for each building utilizing available assessor data and RSMeans 2019 values; a regional location factor for Passaic County was applied (1.20 for residential structures; 1.16 for non-residential structures). Replacement cost value is the current cost of returning an asset to its pre-damaged condition, using present-day cost of labor and materials. Total replacement cost value consists of both the structural cost to replace a building and the estimate value of contents of a building. The occupancy classes available in HAZUS-MH v4.2 were condensed into the following categories (residential, commercial, industrial, agricultural, religious, governmental, and educational) to facilitate the analysis and the presentation of results. Residential loss estimates address both multi-family and single-family dwellings.

Critical Facilities and Lifelines

*A **lifeline** provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security (FEMA).*

The 2015 HMP critical facility inventory, which includes essential facilities, utilities, transportation features and user-defined facilities was updated by the Planning Partnership. The update involved a review for accuracy, additions or deletions of new/moved critical assets, identification of backup power for each asset (if known) and whether the critical facility is considered a lifeline in accordance with FEMA's definition; refer to Appendix E (Risk Assessment Supplement). To protect individual privacy and the security of assets, information is presented in aggregate, without details about specific individual properties or facilities.

Environment

The National Land Cover Database land cover data published by the U.S. Geological Survey in 2016 was used to assess land use characteristics of the County. This dataset models land cover change over seven intervals between 2001 and 2016 (USGS 2016). The C5 decision tree classification software was run on the training samples to generate a set of rules, and the decision rules were applied to generate a land cover classification for each of the seven target years. The classes used from this dataset summarized land use exposure aggregated by residential and non-residential land-use types. Non-residential land-use types incorporated all classes except for those that were aggregated for the residential category (i.e., Developed – Low Intensity, Developed – Medium Intensity, Developed – High Intensity).

New Development

In addition to assessing the vulnerability of the built environment, Passaic County examined recent and anticipated new development. Each jurisdiction was asked to provide a list by parcel ID or address of major development that has taken place over the last 5 years and anticipated major development over the next 5 years.

The New Jersey Highlands Council identified areas of existing development as well as areas of potential growth that may provide insight as to where potential new development may occur in Passaic County. These areas include the Existing Community Zone (both in-fill of new development and re-development), Designated Centers, as well as Sewer Service Areas; refer to Figure 3-13 in Section 3 (County Profile). The New Jersey

Highlands Council assists with planning and considers hazard areas such as floodplains when evaluating new and re-development in the region.

An exposure analysis was conducted in GIS to determine hazard exposure to major development planned for the next 5 years as provided by the County and municipalities. Identifying these changes and integrating into the risk assessment provides communities information to consider when developing the mitigation strategy to reduce these vulnerabilities in the future (one tool in the Mitigation Toolbox discussed in Section 6 – Mitigation Strategy). The identified new development is listed in Section 3 (County Profile) and hazard exposure analysis results are presented in Section 9 (Jurisdictional Annexes) as a table in each annex.

4.2.2 Methodology

To address the requirements of the DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Passaic County used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Three different levels of analysis were used depending upon the data available for each hazard as described below. Table 4.2-1 summarizes the type of analysis conducted by hazard of concern.

1. **Historic Occurrences and Qualitative Analysis** – This analysis includes an examination of historic impacts to understand potential impacts of future events of similar size. In addition, potential impacts and losses are discussed qualitatively using best available data and professional judgement.
2. **Exposure Assessment** – This analysis involves overlaying available spatial hazard layers, or hazards with defined extent and locations, with assets in GIS to determine which assets are located in the impact area of the hazard. The analysis highlights which assets are located in the hazard area and may incur future impacts.
3. **Loss estimation** — The FEMA HAZUS modeling software was used to estimate potential losses for the following hazards: flood, earthquake, hurricane. In addition, an examination of historic impacts and an exposure assessment was conducted for these spatially-delineated hazards.

Table 4.2-1. Summary of Risk Assessment Analyses

Hazard	Population	General Building Stock	Critical Facilities	New Development
Coastal Storms	E, H	E, H	E, H	E
Dam Failure	Q	Q	Q	Q
Disease Outbreak	Q	Q	Q	Q
Drought	Q	Q	Q	Q
Earthquake	E, H	E, H	E, H	E
Extreme Temperatures	Q	Q	Q	Q
Flood	E, H	E, H	E, H	E
Geological Hazards	E	E	E	E
Hazardous Substances	Q	Q	Q	Q
Infestation and Invasive Species	Q	Q	Q	Q
Severe Weather	Q	Q	Q	Q
Severe Winter Storm	Q	Q	Q	Q
Wildfire	E	E	E	E

E – Exposure analysis; H – HAZUS analysis; Q – Qualitative analysis

Hazards U.S. – Multi-Hazard (HAZUS-MH)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or HAZUS. HAZUS was developed in response to the need for more effective national-, state-, and community-level planning and the need to identify areas that face the highest risk and potential for loss. HAZUS was expanded into a multi-hazard methodology, HAZUS-MH with new models for estimating potential losses from wind (hurricanes) and flood (riverine and coastal) hazards. HAZUS-MH is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

HAZUS-MH uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, HAZUS-MH uses default HAZUS-MH provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. HAZUS-MH's open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. More information on HAZUS-MH is available at http://www.fema.gov/hazus.

In general, modeled losses were estimated in the program using user-defined flood depth grids for the flood analysis and probabilistic analyses were performed to develop expected/estimated distribution of losses (mean return period losses) for hurricane wind and seismic hazards. The probabilistic model generates estimated damages and losses for specified return periods (e.g., 100- and 500-year). Table 4.2-2 displays the various levels of analyses that can be conducted using the HAZUS-MH software.

Table 4.2-2. Summary of HAZUS-MH Analysis Levels

HAZUS-MH Analysis Levels	
Level 1	HAZUS-MH provided hazard and inventory data with minimal outside data collection or mapping.
Level 2	Analysis involves augmenting the HAZUS-MH provided hazard and inventory data with more recent or detailed data for the study region, referred to as "local data"
Level 3	Analysis involves adjusting the built-in loss estimation models used for the hazard loss analyses. This Level is typical done in conjunction with the use of local data.

Coastal Storm

A HAZUS-MH v4.2 probabilistic analysis was performed to analyze the wind hazard losses for Passaic County for the 100- and 500-year mean return period events. The probabilistic HAZUS-MH hurricane model activates a database of thousands of potential storms that have tracks and intensities reflecting the full spectrum of Atlantic hurricanes observed since 1886 and identifies those with tracks associated with Passaic County. HAZUS-MH contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Default demographic and updated building and critical facility inventories in HAZUS-MH v4.2 were used for the analysis.

There is currently a FEMA-acknowledged issue with importing user-defined facilities in HAZUS-MH v4.2 for the hurricane wind hazard analysis. To estimate potential losses to user-defined facilities identified by Passaic

County, critical facilities that did not fall within a HAZUS-MH v4.2 critical facility sub-category were appended to the Emergency Operation Centers input in HAZUS-MH Comprehensive Data Management System (CDMS) and uploaded to the program.

In addition to estimating potential losses due to wind, an exposure analysis was conducted using the "Sea – Lake Overland Surge from Hurricanes – SLOSH Model, which represents potential flooding from worst-case combinations of hurricane direction, forward speed, landfall point, and high astronomical tide were used to estimate exposure. Please note these inundation zones do not include riverine flooding caused by hurricane surge or inland freshwater flooding. The model, developed by the NOAA National Hurricane Center to forecast surges that occur from wind and pressure forces of hurricanes, considers only storm surge height and does not consider the effects of waves. The SLOSH spatial data includes boundaries for Category 1 through Category 4 hurricane events.

Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to storm surge, the County's assets were overlaid with the SLOSH hazard area. Assets with their centroid located in the hazard area were totaled to estimate the replacement cost value (structure and content) and population exposed to the hazard.

There are no NJDEP-identified shoreline types in Passaic County characterized as vulnerable to erosion. However, to estimate exposure to long-term coastal erosion for purposes of this risk assessment, the shorelines of the City of Passaic and the City of Clifton was analyzed. To generate the extent of the estimated coastal erosion hazard area (CEHA), an erosion rate of 0.5 meters per year was multiplied by 60 to include all structure types and developed/undeveloped areas (annual erosion rate of 0.5 meters x 60 years = 30 meters or approximately 98 feet). Therefore, population, buildings, and infrastructure within 98 feet of the shoreline are identified as vulnerable to long-term coastal erosion. Please note this methodology assumes that once lost to erosion, an area of land is not subsequently restored. This methodology is consistent with the methods used to evaluate coastal erosion in the 2019 New Jersey State Hazard Mitigation Plan.

In addition, projected sea-level rise data (in one-foot increments) available from the NOAA Office of Coastal Management (https://coast.noaa.gov/slrdata/) was considered and used for this analysis understand the assets within communities projected to be impacted (refer to Section 4.2 – Coastal Storms). Please note these levels do not include additional storm surge due to a hurricane or Nor'easter. The current Flood Insurance Rate Maps (FIRMs) also do not include the effects of sea-level rise. Rutgers University Science and Technical Advisory Panel (STAP) Report, entitled, Assessing New Jersey's Exposure to Sea-Level Rise and Coastal Storms: Report of the New Jersey Climate Adaptation Alliance Science and Technical Advisory Panel details several projected sea level rise scenarios for New Jersey between 2030 and 2100. Using these estimates, the sea level rise +1 ft and sea level rise +3 ft inundation areas were chosen and used in the 2019 New Jersey State Hazard Mitigation Plan. To be consistent with the State HMP, these spatial datasets were used for the 2020 Passaic County HMP update.

Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses. To determine what assets are exposed to sea-level rise, the County's assets were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the number and values exposed to sea-level rise.

Sea level rise data available from the New Jersey Northern Transportation Planning Authority (NJTPA) was also incorporated in this hazard section to assess future risk to sea level risk projections. The NJTPA recently completed the Passaic River Basin Climate Resilience Planning Study (2019) which assessed the potential for increasingly severe and frequent storm and heat events along with rising sea levels in the Passaic River Basin.

The riverine and coastal spatial data generated as a result of this study (25- and 100-year precipitation events for today and planning horizons 2045 and 2080) were used to help understand the change in building exposure as the climate changes. It is important to note that only the existing 100-year precipitation event in the Passaic River Basin was included in this analysis; not the entire 1-percent annual chance floodplain modeled for this HMP.

Dam Failure

Assets that fall with dam inundation hazard areas within Passaic County are at greatest risk of impacts from dam failure events. A qualitative assessment was conducted for the dam failure hazard. Because of the sensitive nature of the dam failure inundation zones, potential losses have not been quantified and presented in the vulnerability assessment.

Disease Outbreak

All of Passaic County is exposed to disease outbreak events. A qualitative assessment was conducted for the disease outbreak hazard. Research from the Centers for Disease Control and Prevention was utilized to qualitatively assess the most recent COVID-19 outbreak.

Drought

To assess the vulnerability of Passaic County to drought and its associated impacts, a qualitative assessment was conducted. The United States Department of Agriculture (USDA) Census of Agriculture 2017 was used to estimate economic impacts. Information regarding the number of farms, land area in farms, etc. was extracted from the report and summarized in the vulnerability assessment. Additional resources from the Centers for Disease Control and Prevention and the U.S. Environmental Protection Agency were used to assess the potential impacts to the population from a drought event.

Earthquake

A probabilistic assessment was conducted for Passaic County for the 100-, 500- and 2,500-year MRPs through a Level 2 analysis in HAZUS-MH v4.2 to analyze the earthquake hazard and provide a range of loss estimates. The probabilistic method uses information from historic earthquakes and inferred faults, locations and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the HAZUS-MH Earthquake User Manual, "*Although the software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of buildings and facilities of different sizes, shapes, and structural systems that have been constructed over a range of years under diverse seismic design codes. There are a variety of components that contribute to transportation and utility system damage estimations. These components can have differing seismic resistance.*" (FEMA 2020). However, HAZUS' potential loss estimates are acceptable for the purposes of this HMP.

Ground shaking is the primary cause of earthquake damage to man-made structures and soft soils amplify ground shaking. One contributor to the site amplification is the velocity at which the rock or soil transmits shear waves (S-waves). The National Earthquake Hazard Reductions Program (NEHRP) has developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses.

Furthermore, ground liquefaction may occur due to earthquakes around low-lying areas near waterways. Liquefaction is the conversion of water-saturated soil into a fluid-like mass. The New Jersey Department of Environmental Protection and New Jersey Geological and Water Survey (NJGWS) developed a liquefaction susceptibility layer for Passaic County. Susceptibility was mapped based on grain-size, compaction, and degree of saturation of soils as determined from published and un-published geologic-map and well-log data on file at the NJGWS. The range of liquefaction susceptibility was mapped as Class 0 – none through Class 4 – high.

An exposure analysis was also conducted for the County's assets (population, building stock, critical facilities, and new development) using the NEHRP soil data and liquefaction susceptibility data. NEHRP Soil Classes Type D and Type E and liquefaction susceptibility Class 4 were used to determine what assets are exposed to the soils most susceptible to seismic activity. Assets with their centroid in the hazard areas were totaled to estimate the numbers and values vulnerable to these soil types.

Data from the New Jersey Geologic and Water Survey was used in HAZUS-MH v4.2 to replace default NEHRP, liquefaction susceptibility, and landslide susceptibility conditions. Groundwater was set at depth of five (5) feet (default setting). The default assumption is a magnitude 7.0 earthquake for all return periods. Damage and loss due to liquefaction, landslide, or surface fault rupture were not included in this analysis. Although damages are estimated at the census tract level, results were presented at the municipal level.

Damage estimates are calculated for losses to buildings (structural and non-structural) and contents; structural losses include load carrying components of the structure, and non-structural losses include those to architectural, mechanical, and electrical components of the structure, such as nonbearing walls, veneer and finishes, HVAC systems, boils, etc.

Extreme Temperatures

All of Passaic County is exposed to extreme temperature events. A qualitative assessment was conducted for the extreme temperatures hazard. Information from the Centers for Disease Control and Prevention, Passaic County, stakeholder plans/reports and the Planning Partnership were used to assess the potential impacts to the County's assets.

Flood

The 1- and 0.2-percent chance flood events were examined to evaluate Passaic County risk and vulnerability to the riverine flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as the NFIP.

The effective Passaic County FEMA Digital Flood Insurance Rate Map (DFIRM) dated April 16, 2020 was used to evaluate exposure and determine potential future losses. A depth grid was generated using the effective DFIRM and a 10-foot resolution Digital Elevation Model (DEM) downloaded from the New Jersey Geographic Information Network web portal. The final depth grid was integrated into the HAZUS-MH v4.2 riverine flood model used to estimate potential losses for the 1-percent annual chance flood event.

To estimate exposure to the 1-percent- and 0.2-percent annual chance flood events, the DFIRM flood boundaries were overlaid on centroids of updated assets (population, building stock, critical facilities, and new development). Centroids that intersected the flood boundaries were totaled to estimate the building replacement cost value and population vulnerable to the flood inundation areas. A Level 2 HAZUS-MH v4.2 riverine flood analysis was performed. Both the critical facility and building inventories were formatted to be compatible with HAZUS-MH v4.2 and its Comprehensive Data Management System (CDMS). Once updated with the inventories, the HAZUS-MH v4.2 riverine flood model was run to estimate potential losses in Passaic County for the 1-percent annual chance flood event. A user-defined analysis was also performed for the building stock.

Buildings located within the floodplain were imported as user-defined facilities to estimate potential losses to the building stock at the structural level. HAZUS-MH v4.2 calculated the estimated potential losses to the population (default 2010 U.S. Census data), potential damages to the general building stock, and potential damages to critical facility inventories based on the depth grids generated and the default HAZUS-MH v4.2 damage functions in the flood model.

Locations identified as repetitive and severe repetitive properties provided and summarized to obtain an understanding of repetitive flood loss areas.

Areas of forests, wetlands, and critical habitat landscapes located within the 1- and 0.2-percent annual chance flood event boundaries were also calculated to estimate impacts on the environment. The boundaries of these areas were intersected with the floodplains in ArcGIS to calculate the areas exposed to the 1- and 0.2-percent annual chance flood events.

Geological Hazards

The New Jersey Geologic and Water Survey delineated a landslide susceptibility layer that differentiates areas based on the ground surface and slope. This layer was created in 2015 and utilized for this analysis. The categories are defined as follows:

- Class A
  - AI – Strongly cemented rock; slope angle of 15-20 degrees
  - AII – Strongly cemented rock; slope angle of 20-30 degrees
  - AIV – Strongly cemented rock; slope angle of 30-40 degrees
  - AVI – Strongly cemented rock; slope angle of greater than 40 degrees
- Class B
  - BIII – Weakly cemented rock and sandy soil; slope angle of 10-15 degrees
  - BIV – Weakly cemented rock and sandy soil; slope angle of 15-20 degrees
  - BV – Weakly cemented rock and sandy soil; slope angle 20-30 degrees
- Class C
  - CVI – Shales and clayey soil; slope angle of 10-15 degrees
  - CVII – Shales and clayey soil; slope angle of 15-20 degrees
  - CIX – Shales and clayey soil; slope angle of 20-40 degrees if dry or 10-15 degrees if groundwater at surface
  - CX – Shales and clayey soil, groundwater at surface; slope angle greater than 15 degrees

To determine what assets are exposed to landslide, the County's assets were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the number (or count) and replacement cost values exposed to a hazard event.

Hazardous Substance

All of Passaic County is exposed to hazardous substance events; both in-transit and at fixed sites. Impacts depend upon the location of release and chemical and physical properties of the hazardous material(s) involved. A qualitative assessment was conducted for the hazardous substance hazard. Information from Passaic County and the Planning Partnership were used to assess the potential impacts to the County's assets.

Infestation and Invasive Species

All of Passaic County is exposed to infestation and invasive species. This is a new hazard of concern for Passaic County. A qualitative assessment was conducted.

Severe Weather

All of Passaic County is exposed to severe weather events. A qualitative assessment was conducted for the severe weather hazard with supporting information discussed in other hazard sections (e.g., Coastal Storm and Flood). Information from Passaic County and the Planning Partnership were used to assess the potential impacts to the County's assets.

Severe Winter Storm

All of Passaic County (population, buildings and environment) is exposed and vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. A percentage of the custom-building stock structural replacement cost value was utilized to estimate damages that could result from winter storm conditions (i.e., 1-percent, 5-percent, and 10-percent of total replacement cost value). Given professional knowledge and currently available information, the potential losses for this hazard are considered to be overestimated; hence, providing a conservative estimate for losses associated with winter storm events.

Wildfire

The NJFFS uses Wildfire Fuel Hazard data to assign wildfire fuel hazard rankings across the State. This data, developed in 2009, is based upon NJDEP's 2002 Land Use/Land Cover datasets and NJDEP's 2002 10-meter Digital Elevation Grid datasets. For the wildfire hazard, the NJFFS Wildfire Fuel Hazard "extreme', 'very high' and 'high' areas are identified as the wildfire hazard area. The defined hazard area was overlaid upon the asset data (population, building stock, critical facilities and potential new development) to estimate the exposure to each hazard.

To determine what assets are exposed to wildfire, the County's assets (population, building stock, critical facilities, and new development) were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate building replacement cost value and population exposed to a wildfire event.

Considerations for Mitigation and Next Steps

The following items are to be discussed for considerations for the next plan update to enhance the vulnerability assessment:

- All Hazards
  - Utilize updated and current demographic data. If 2020 U.S. Census demographic data is available at the U.S. Census block level during the next plan update, use the census block estimates and residential structures for a more precise distribution of population, or the current American Community Survey 5-Year Estimate populations counts at the Census tract level.
- Coastal Storms
  - The general building stock inventory can be updated to include attributes regarding protection against strong winds, such as hurricane straps, to enhance loss estimates.
  - Estimate storm surge related losses using the HAZUS-MH flood model, if the data is available.
  - If available during the next plan update, update the risk assessment using a comprehensive coastal erosion hazard area map and updated sea level rise inundation areas.
  - Collect data on historic costs incurred to reconstruct buildings, cultural resources and/or infrastructure due to coastal erosion impacts.
  - Integrate evacuation route data that is currently being developed.
- Flood
  - The general building stock inventory can be updated to include attributes regarding first floor elevation and foundation type (basement, slab on grade, etc.) to enhance loss estimates.

  - Conduct a HAZUS-MH loss analysis for more frequent flood events (e.g., 10 and 50-year flood events).
  - Further refine the repetitive loss area analysis.
  - Continue to expand and update urban flood areas to further inform mitigation.
- Earthquake
  - Identify unreinforced masonry in critical facilities and privately-owned buildings (i.e., residences) by accessing local knowledge, tax assessor information, and/or pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response/recovery efforts at these properties can be developed.
- Extreme Temperatures
  - Track extreme temperature data for injuries, deaths, shelter needs, pipe freezing, agricultural losses, and other impacts to determine distributions of most at risk areas.
- Geological Hazards
  - A pilot study conducted in Schenectady County, NY (Landslide Susceptibility – A Pilot Study of Schenectady County, NY) provided a detailed methodology for delineating high-risk landslide areas. This study looked at a variety of environmental characteristics including slope and soil conditions to determine areas at risk to landslide. To coincide with the methodology of that study, the generated slopes were categorized into five classes: 0%-2%; 3%-7%; 8%-15%; 16%-25%; Greater than 25%. Should the County determine the need for a more detailed assessment of risk, the slopes greater than 25% should be used to delineate the hazard area for the vulnerability assessment. Additional environmental and soil characteristics used in the Schenectady County plan can be collected and used to follow the methodology and further delineate Passaic County's most at risk areas.
- Wildfire
  - General building stock inventory can be updated to include attributes such as roofing material or fire detection equipment or integrate distance to fuels as another measure of vulnerability.
- Disease Outbreak, Hazardous Substances
  - Additional information regarding localized concerns and past impacts may be collected and analyzed.

4.2.3 Data Source Summary

Table 4.2-3 summarizes the data sources used for the risk assessment for this plan.

Table 4.2-3. Risk Assessment Data Documentation

Data	Source	Date	Format
Population data	U.S. Census Bureau; American Community Survey 5-Year Estimates	2010; 2017	Digital (GIS) format
Building footprints	Microsoft; Open Street Map	2018; 2019	Digital (GIS) format
MODIV Tax Assessor data	NJ Office of Information Technology	2018	Digital (GIS/Tabular) format
Critical facilities	Passaic County Steering Committee and Planning Committee	2019	Digital (GIS) format
Digitized Effective FIRM maps (2020)	FEMA	2020	Digital (GIS) format
NEHRP Soil	NJDEP/NJGWS	2015	Digital (GIS) format
Liquefaction Susceptibility	NJDEP/NJGWS	2015	Digital (GIS) format
Landslide Susceptibility	NJDEP/NJGWS	2015	Digital (GIS) format
Carbonate Rock Soil Data	NJDEP	2006	Digital (GIS) format
Wildfire Fuel Hazard	NJFFS	2009	Digital (GIS) format

Data	Source	Date	Format
Census of Agriculture	USDA	2017	Digital (PDF Report) format
1-foot Sea Level Rise	NOAA	2016	Digital (GIS) Format
3-foot Sea Level Rise	NOAA	2016	Digital (GIS) Format
Sea-Lake Overland Surge from Hurricanes (SLOSH) Model	NOAA	2016	Digital (GIS) Format
10-foot Resolution Digital Elevation Model	NJGIN	Various Collection Years (Accessed 2019)	Digital (GIS) Format

Limitations

Loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

1) Approximations and simplifications necessary to conduct such a study
2) Incomplete or dated inventory, demographic, or economic parameter data
3) The unique nature, geographic extent, and severity of each hazard
4) Mitigation measures already employed by the participating municipalities
5) The amount of advance notice residents have to prepare for a specific hazard event
6) Uncertainty of climate change projections

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term, Passaic County will collect additional data to collect additional data, update and refine existing inventories, to assist in estimating potential losses.

Potential economic loss is based on the present value of the general building stock utilizing best available data. The County acknowledges significant impacts may occur to critical facilities and infrastructure as a result of these hazard events causing great economic loss. However, monetized damage estimates to critical facilities and infrastructure, and economic impacts were not quantified and require more detailed loss analyses. In addition, economic impacts to industry such as tourism and the real-estate market were not analyzed.

4.3 Hazards of Concern

The Passaic County hazards of concern are presented in Section 4.3 and outlined as follows:

- **Hazard Profile**
  - Location - geographic area most affected by the hazard
  - Extent – severity of each hazard
  - Previous Occurrences and Losses
  - Impacts of Climate Change
  - Probability of Future Hazard Events
- **Vulnerability Assessment**
  - Impact to Population
  - Impact to Buildings
  - Impact to Critical Facilities and Lifelines
  - Impact to Economy
  - Future Changes that may Impact Vulnerability
  - Vulnerability Changes Since 2015

4.3.1 Coastal Storms

The following section provides the hazard profile and vulnerability assessment for the coastal storms hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- The profile now includes coastal erosion, hurricanes/tropical storms, Nor'Easters, storm surge and coastal flooding.
- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 2014 and 2019.
- A vulnerability assessment was conducted using an updated asset inventory.

4.3.1.1 Profile

Hazard Description

The coastal storm hazard includes coastal erosion, hurricanes and tropical storms, Nor'Easters, storm surge and coastal flooding. Detailed information regarding these hazards in Passaic County are discussed further in this section.

Coastal Erosion

Erosion and flooding are the primary coastal hazards that lead to the loss of lives or damage to property and infrastructure in developed coastal areas. One of the greatest threats from a coastal storm is coastal flooding caused by storm surge. Coastal flooding is the inundation of land areas along the oceanic coast and estuarine shoreline by seawaters over and above normal tidal action.

Many natural factors affect erosion of the shoreline, including shore and nearshore morphology, shoreline orientation, and the response of these factors to storm frequency and sea level rise. Coastal shorelines change

constantly in response to wind, waves, tides, sea-level fluctuation, seasonal and climatic variations, human alteration, and other factors that influence the movement of sand and material within a shoreline system.

Unsafe tidal conditions, as a result of high winds, heavy surf, erosion, and fog are ordinary coastal hazard phenomena. Some or all of these processes can occur during a coastal storm, resulting in an often-detrimental impact on the surrounding coastline. Factors including: (1) storms such as Nor'Easters and hurricanes, (2) decreased sediment supplies, and (3) sea-level rise contribute to these coastal hazards.

Coastal erosion can result in significant economic loss through the destruction of buildings, roads, infrastructure, natural resources, and wildlife habitats. Damage often results from an episodic event with the combination of severe storm waves and dune or bluff erosion.

Hurricanes and Tropical Storms

A tropical cyclone is characterized by a low-pressure center and numerous thunderstorms that produce strong winds and heavy rain. Tropical depressions, tropical storms, and hurricanes are all considered tropical cyclones. Tropical cyclones strengthen when water evaporated from the ocean is released as the saturated air rises, resulting in condensation of water vapor contained in the moist air. These storms rotate counterclockwise in the northern hemisphere around the center and are accompanied by heavy rain and strong winds (NOAA 2020a). Almost all tropical storms and hurricanes in the Atlantic basin (which includes the Gulf of Mexico and Caribbean Sea) form between June 1 and November 30 (hurricane season). August and September are peak months for hurricane development (NOAA 2020a).

Tropical cyclones are fueled by a different heat mechanism than other cyclonic windstorms such as Nor'Easters and polar lows. The characteristic that separates tropical cyclones from other cyclonic systems is that at any height in the atmosphere, the center of a tropical cyclone will be warmer than its surroundings; a phenomenon called "warm core" storm systems (NOAA n.d.).

Storm surges inundate coastal floodplains by dune overwash, tidal elevation rise in inland bays and harbors, and backwater flooding through coastal river mouths. Strong winds can increase tide levels and water-surface elevations. Storm systems generate large waves that run up and flood coastal beaches. The combined effects create storm surges that affect the beach, dunes, and adjacent low-lying floodplains. Shallow, offshore depths can cause storm-driven waves and tides to pile up against the shoreline and inside bays.

Based on an area's topography, a storm surge may inundate only a small area (along sections of the northeast or southeast coasts) or storm surge may inundate coastal lands for a mile or more inland from the shoreline (NOAA n.d.).

Nor'Easter

A Nor'Easter is a cyclonic storm that moves along the East Coast of North America. It is called a Nor'Easter because the damaging winds over coastal areas blow from a northeasterly direction. Nor'Easters can occur any time of the year but are most frequent and strongest between September and April. These storms usually develop between Georgia and New Jersey within 100 miles of the coastline and typically move from southwest to northeast along the Atlantic Coast of the United States (NWS n.d.). A Nor'Easter event can cause storm surges, waves, heavy rain, heavy snow, wind, and coastal flooding. Nor'Easters have diameters that can span 1,200 miles, impacting large areas of coastline. The forward speed of a Nor'Easter is usually much slower than a hurricane, so with the slower speed, a Nor'Easter can linger for days and cause tremendous damage to those areas impacted. In order to be called a Nor'Easter, a storm must have the following conditions, as per the Northeast Regional Climate Center (NRCC):

- Must persist for at least a 12-hour period
- Have a closed circulation
- Be located within the quadrilateral bounded at 45°N by 65° and 70°W, and at 30°N by 85°W and 75°W
- Show general movement from the south-southwest to the north-northeast
- Contain wind speeds greater than 23 mph

A Nor'Easter event can cause storm surges, waves, heavy rain, heavy snow, wind, and coastal flooding. Nor'Easters have diameters that can span 1,200 miles, impacting large areas of coastline. The forward speed of a Nor'Easter is usually much slower than a hurricane, so with the slower speed, a Nor'Easter can linger for days and cause tremendous damage to those areas impacted. Approximately 20 to 40 Nor'Easters occur in the northeastern United States every year, with at least two considered severe (Storm Solution 2014). New Jersey can be impacted by 10 to 20 Nor'Easters each year, with approximately 5 to 10 of those having significant impact on the state. The intensity of a Nor'Easter can rival that of a tropical cyclone in that, on occasion, it may flow or stall off the Mid-Atlantic Coast resulting in prolonged episodes of precipitation, coastal flooding, and high winds (NWS n.d.).

Location

All of Passaic County is vulnerable to coastal storms; however, storm impacts depend on the storm's track. Inland areas of Passaic County are at risk to flooding due to heavy rains and winds produced by hurricanes, tropical storms, and Nor'Easters. As seen in Figure 4.3.1-1, the only area of coastline is in the Cities of Clifton and Passaic as defined by the NJDEP. This area is susceptible to tidal and storm surges along the Passaic River, as well as erosion along this shoreline.

The FEMA Region IV Risk Analysis Team developed storm surge inundation grids for the state in a spatial format from the maximum of maximums outputs from the SLOSH model. These represent the worst-case storm surge scenarios for each hurricane category (1 through 4). Figure 4.3.1-2 illustrates these SLOSH zones in Passaic County.

Projected sea-level rise data (in one-foot increments) available from the NOAA Office of Coastal Management (https://coast.noaa.gov/slrdata/) was considered and used for this analysis. Please note these levels do not include additional storm surge due to a hurricane or Nor'easter. The current Flood Insurance Rate Maps (FIRMs) also do not include sea-level rise. Rutgers University Science and Technical Advisory Panel (STAP) Report, entitled, Assessing New Jersey's Exposure to Sea-Level Rise and Coastal Storms: Report of the New Jersey Climate Adaptation Alliance Science and Technical Advisory Panel details several projected sea level rise scenarios for New Jersey between 2030 and 2100. Using these estimates, the sea level rise +1 ft and sea level rise +3 ft inundation areas were chosen and used in the 2019 New Jersey State Hazard Mitigation Plan. To be consistent with the State HMP, these spatial datasets were used for the 2020 Passaic County HMP update.

Storm surge and sea level rise were also assessed using SLOSH data from NOAA's National Hurricane Center and NOAA's 1- and 3-foot increment sea level rise data, respectively

Figure 4.3.1-1. Passaic County Coastline

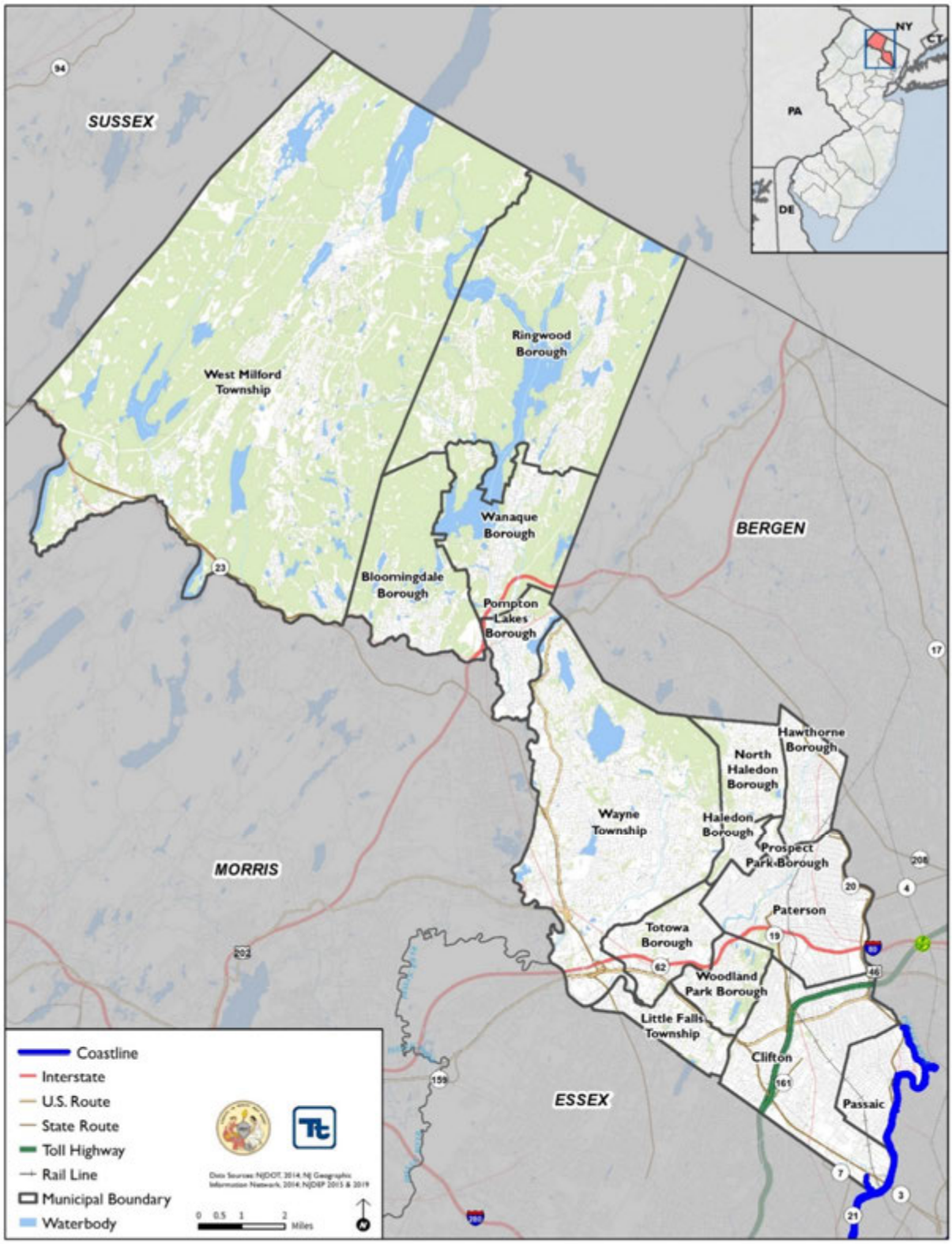


Figure 4.3.1-2. FEMA Region IV SLOSH Model (Categories 1 through 4)

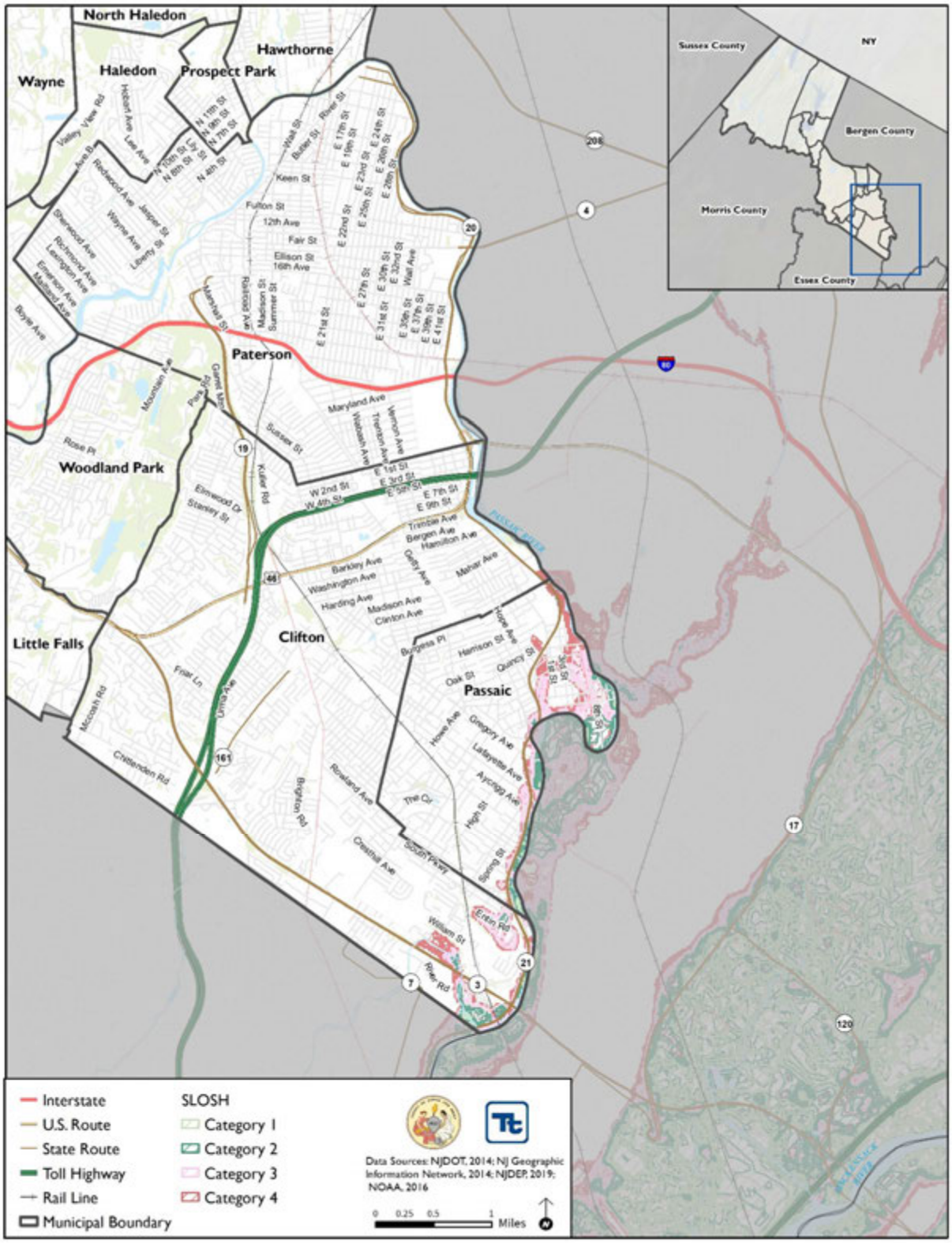
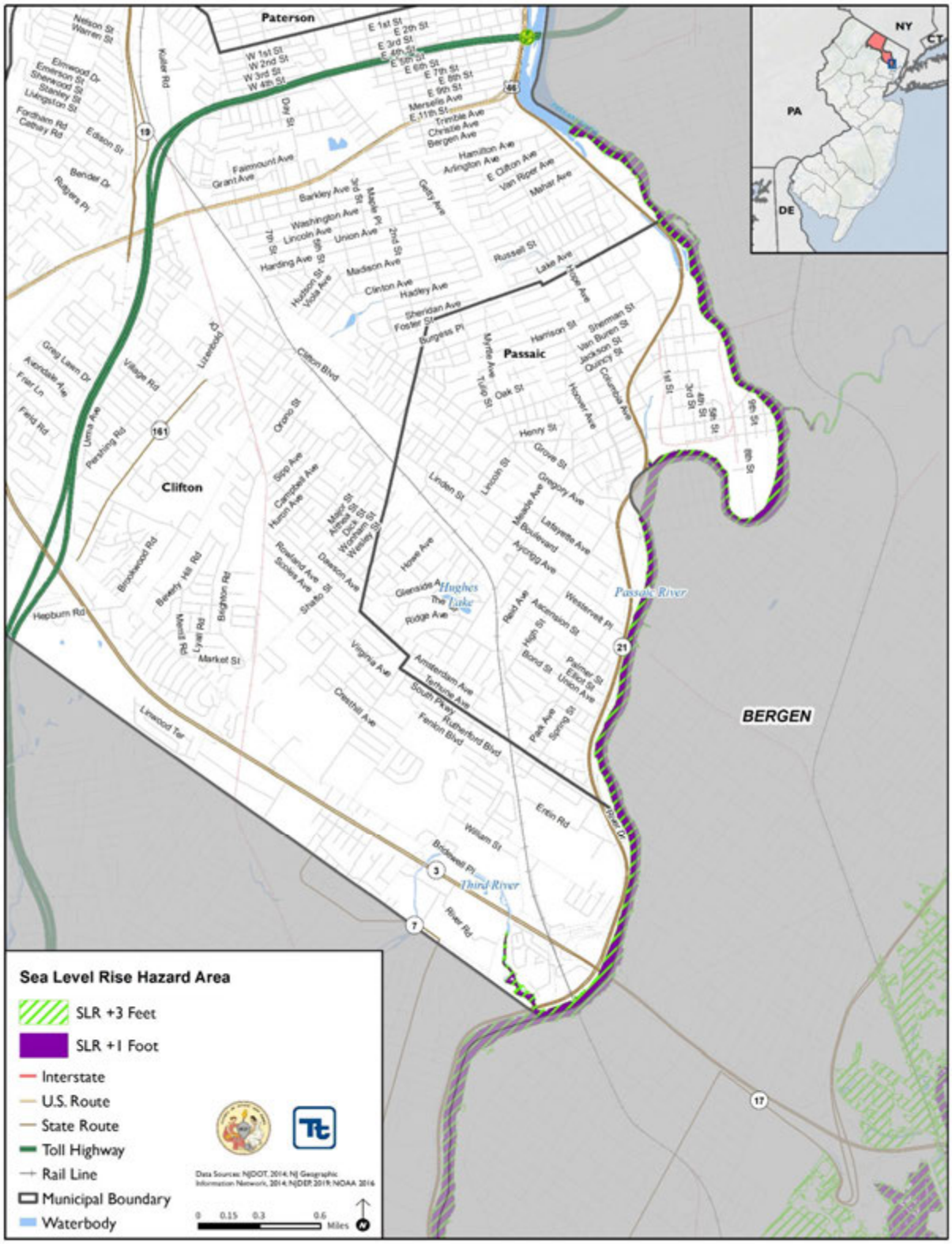


Figure 4.3.1-3. Sea Level Rise 1 Foot and 3 Foot Hazard Areas Assessed in Passaic County



Extent

Coastal Erosion

Coastal erosion is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time (FEMA 1996). A number of factors determine whether a community exhibits greater long-term erosion or accretion:

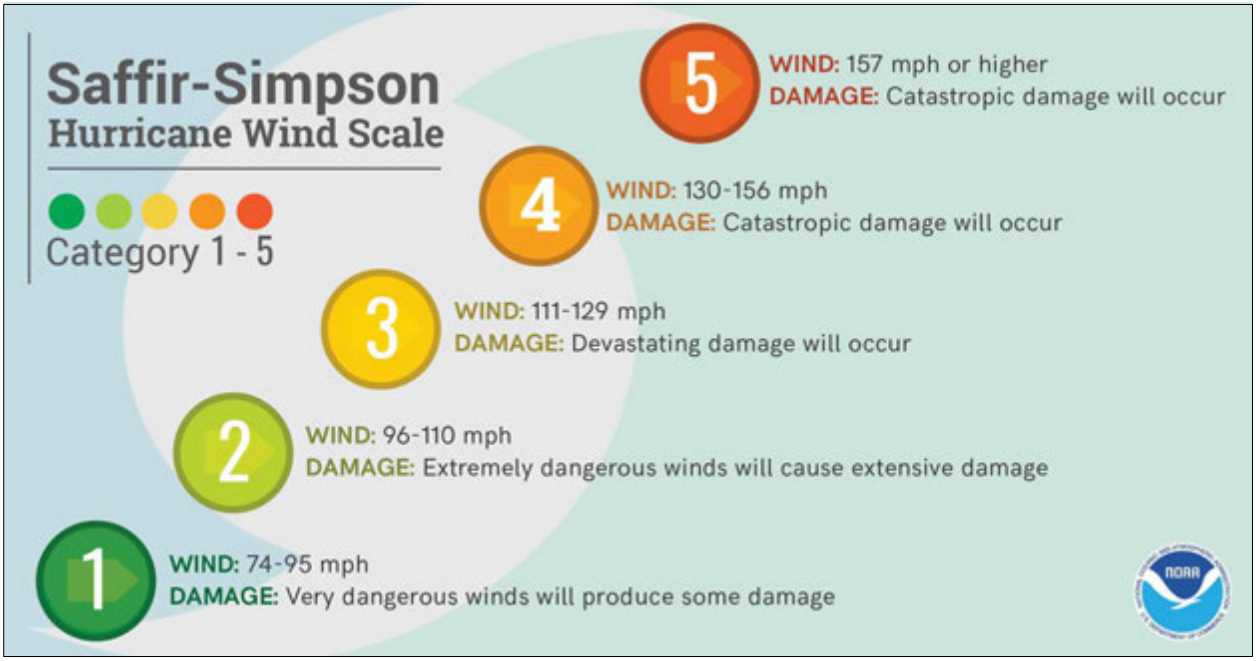
- Exposure to high-energy storm waves
- Sediment size and composition of eroding coastal landforms feeding adjacent beaches
- Near-shore bathymetric variations which direct wave approach
- Alongshore variations in wave energy and sediment transport rates
- Relative sea level rise
- Frequency and severity of storm events
- Human interference with sediment supply (e.g., revetments, seawalls, jetties)
- (Woods Hole Sea Grant 2003)

Such erosion may be intensified by activities such as boat wakes, shoreline hardening, or dredging. Natural recovery after erosive episodes can take months or years. If a dune or beach does not recover quickly enough via natural processes, coastal and upland property may be exposed to further damage in subsequent events. Coastal erosion can cause the destruction of buildings and infrastructure (FEMA 1996).

Hurricane and Tropical Storms

The extent of a hurricane or tropical storm is commonly categorized in accordance with the Saffir-Simpson Hurricane Wind Scale, which assigns a designation of tropical storm for storms with sustained wind speeds below 74 mph and a hurricane category rating of 1–5 based on a hurricane's increasing sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Tropical Storms and Category 1 and 2 storms are still dangerous and require preventative measures (NOAA 2013). Figure 4.3.1-4 presents this scale, which is used to estimate the potential property damage and flooding expected when a hurricane makes landfall.

Figure 4.3.1-4. Saffir-Simpson Scale



Source: Disaster Readiness Portal 2017

The National Weather Service (NWS) issues hurricane and tropical storm watches and warnings. These watches and warnings are issued or will remain in effect after a tropical cyclone becomes post-tropical, when such a storm poses a significant threat to life and property. The NWS allows the National Hurricane Center (NHC) to issue advisories during the post-tropical stage. The following are the definitions of the watches and warnings:

- Hurricane/Typhoon Warning is issued when sustained winds of 74 mph or higher are expected somewhere within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the warning is issued 36 hours in advance of the anticipated onset of tropical storm-force winds. The warning can remain in effect when dangerously high water or combination of dangerously high water and waves continue, even though winds may be less than hurricane force.
- Hurricane Watch is issued when sustained winds of 74 mph or higher are possible within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane watch is issued 48 hours prior to the anticipated onset of tropical storm-force winds.
- Tropical Storm Warning is issued when sustained winds of 39 to 73 mph are expected somewhere within the specified area within 36 hours in association with a tropical, subtropical, or post-tropical storm.
- Tropical Storm Watch is issued when sustained winds of 39 to 73 mph are possible within the specified area within 48 hours in association with a tropical, sub-tropical, or post-tropical storm.
- (NWS 2020)

Mean Return Period

In evaluating the potential for hazard events of a given magnitude, an MRP is often used. The MRP provides an estimate of the magnitude of an event that may occur within any given year based on past recorded events. MRP is the average period of time, in years, between occurrences of a particular hazard event, equal to the inverse of the annual frequency of exceedance (Dinicola 2009).

Figure 4.3.1-5 and Figure 4.3.1-6 show the estimated maximum 3-second gust wind speeds that can be anticipated in the study area associated with the 100- and 500-year MRP events. These peak wind speed projections were generated using HAZUS-MH model runs. The estimated hurricane track used for the 100- and 500-year event is also shown. The maximum 3-second gust wind speeds for Passaic County fall within the Tropical Storm category for the 100-year MRP event (i.e., 60 to 73 miles per hour). The maximum 3-second gust wind speeds for Passaic County fall within the Category 1 hurricane speed range for the 500-year MRP event (i.e., 81 to 89 miles per hour). The associated impacts and losses from these 100-year and 500-year MRP hurricane event model runs are reported in the Vulnerability Assessment, later in this section.

Figure 4.3.1-5. Wind Speeds for the 100-Year Mean Return Period Event

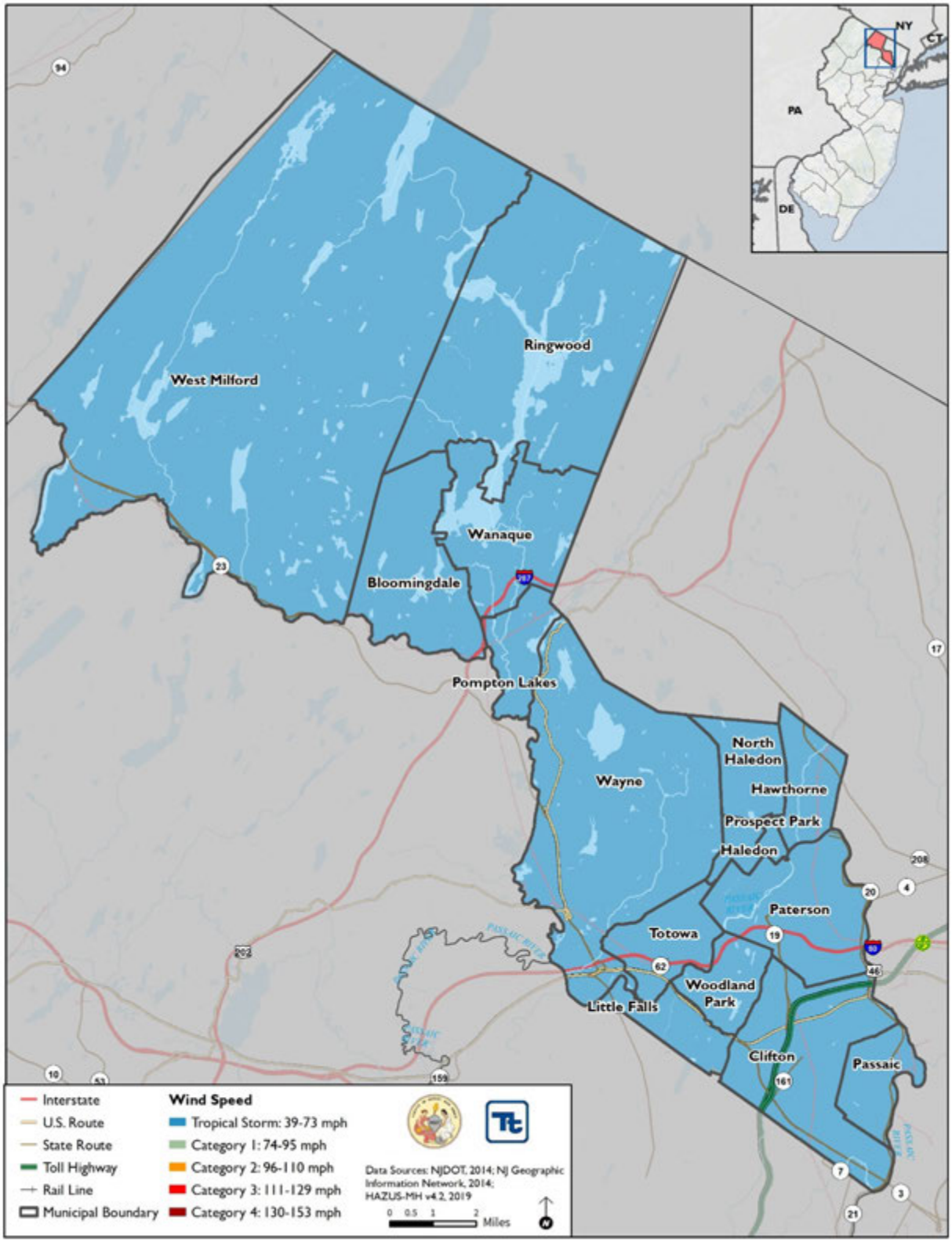
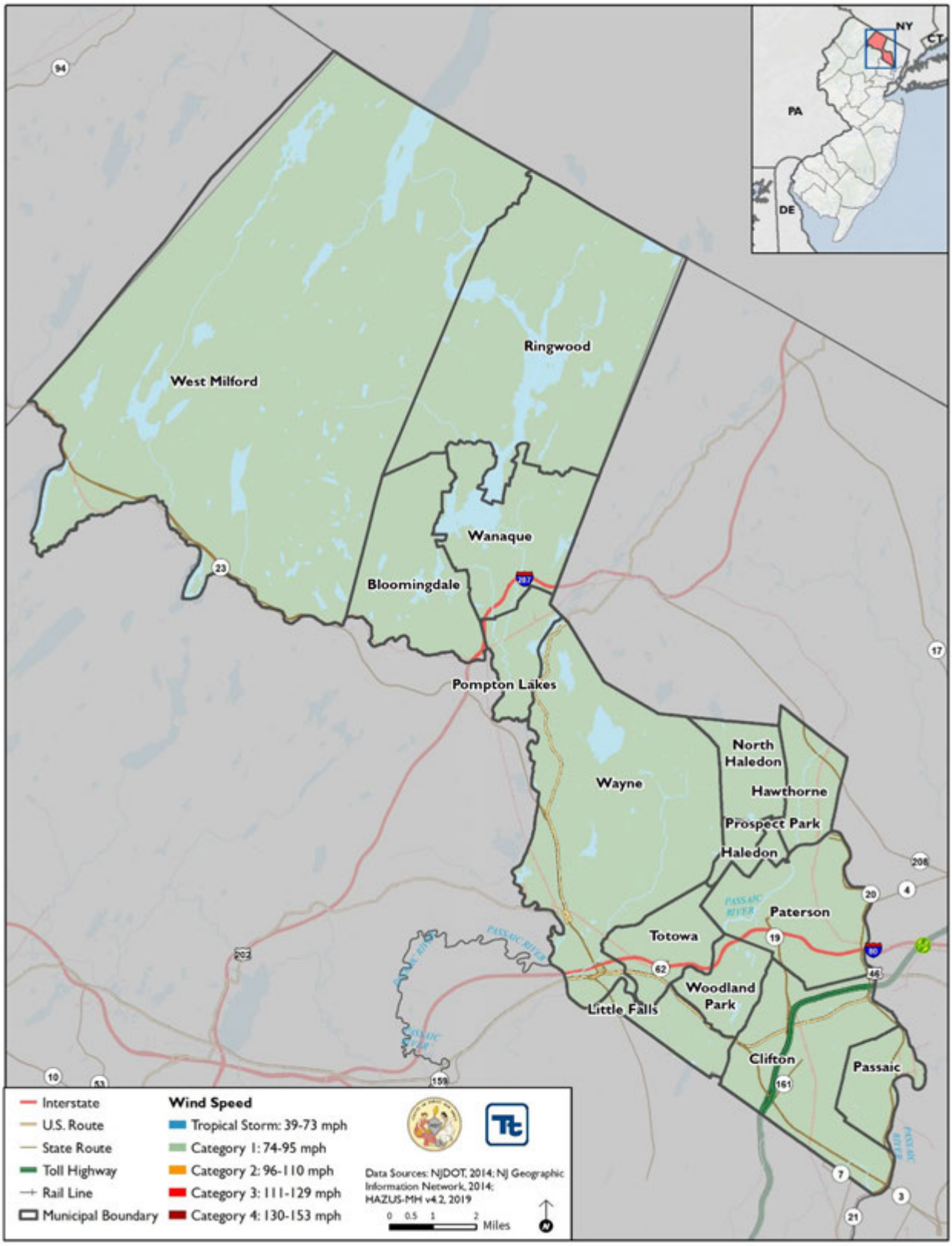


Figure 4.3.1-6. Wind Speeds for the 500-Year Mean Return Period Event



Nor'Easter

A Nor'Easter event can cause storm surges, waves, heavy rain, heavy snow, wind, and coastal flooding. The extent of a Nor'Easter can be classified by meteorological measurements and by evaluating its societal impacts. NOAA's NCDC is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5. It is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population (based on the 2000 U.S. Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCDC 2011). Table 4.3.1-1 lists the five categories.

Table 4.3.1-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18+

Source: NOAA-NCDC 2011
RSI Regional Snowfall Index

Nor'Easters have the potential to impact society to a greater extent than hurricanes and tornadoes. These storms often have a diameter three to four times larger than a hurricane and therefore, impact much larger areas. More homes and properties become susceptible to damage as the size and strength of a Nor'Easter intensifies (Storm Solutions n.d.).

Storm Surge

Typically, storm surge is estimated by subtracting the regular/astrological tide level from the observed storm tide. Typical storm surge heights range from several feet to more than 25 feet. The exact height of the storm surge and which coastal areas will be flooded depends on many factors: strength, intensity, and speed of the hurricane or storm; the direction it is moving relative to the shoreline; how rapidly the sea floor is sloping along the shore; the shape of the shoreline; and the astronomical tide. Storm surge is the most damaging when it occurs along a shallow sloped shoreline, during high tide, and in a highly populated and developed area with little or no natural buffers (for example, barrier islands, coral reefs, and coastal vegetation).

Coastal Flooding

The severity of a coastal flood depends not only on the amount of water that accumulates, but also on the land's ability to manage the water. When a coastal storm causes coastal flooding, soil acts as a sponge. If the land was previously saturated or frozen, infiltration rates decrease, causing the area to flood (NJOEM 2019). NWS uses a coastal flood monitor to describe general impacts during times of high water on the coast. See Table-4.3.1-2 for the National Weather Service's stages to describe the levels of flood stages and expected damage at those levels.

Table-4.3.1-2. Coastal Flood Monitor

Flood Stage	Expected Damage
Action Stage	Should water levels continue rising, preparations to protect property should begin.
Minor Flood	Minimal or no property damage. Flooding of low-lying roads near the coast.
Moderate Flood	Some inundation of structures and flooding roads. Evacuation of people or property to higher elevations possible.

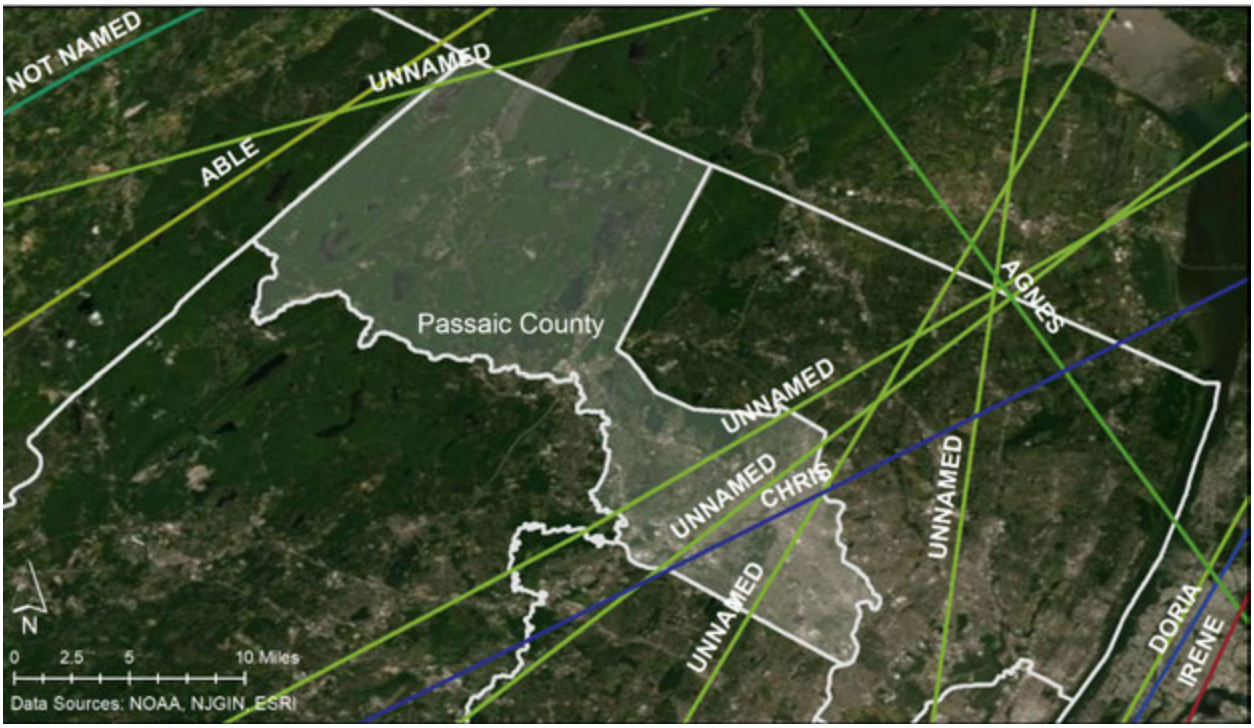
Flood Stage	Expected Damage
Major Flood	Extensive inundation of structures in roads in the area. Evacuations of people or transfer or property to higher elevations likely.

Source: NWS 2020

Previous Occurrences and Losses

NOAA's Historical Hurricane Tracks tool is a public interactive mapping application that displays Atlantic Basin and East-Central Pacific Basin tropical cyclone data. This interactive tool catalogs tropical cyclones that have occurred from 1842 to 2019 (latest date available from data source). Between 1842 and 2019, 31 tropical cyclones tracked within 65 nautical miles of Passaic County. Figure 4.3.1-7 displays tropical cyclone tracks for Passaic County that tracked with 65 nautical miles between 1880 and 2019 (only three unnamed tropical storm events). Please note that this figure does not show Hurricane Sandy because it did not pass Passaic County within 65 nautical miles. However, Hurricane Sandy severely impacted the County with strong winds and county-wide power outages. Refer to the "Previous Events and Losses" section for further information regarding coastal storm events that impacted Passaic County since 2014.

Figure 4.3.1-7. Historical Tropical Storm and Hurricane Tracks 1880 to 2019



Source: NOAA 2020b

According to the NOAA-NCEI Storm Events Database and NHC, from 1950 to 2019, Passaic County has been impacted by 36 coastal storm-related events that caused four fatalities, 0 injuries, $6,050,000 million in property damage, and $0 in crop damage.

Table 4.3.1-3. Coastal Storm Events, 1950 to 2019

Hazard Type	Number of Occurrences Between 1950 and 2018	Total Fatalities	Total Injuries	Total Property Damage ($)	Total Crop Damage ($)
Coastal Erosion	1	0	0	$5 M	$0
Hurricanes / Tropical Storms*	29	4	0	$1.050M	$0
Nor'Easter	1	0	0	$0	$0
Storm Surge	0	0	0	$0	$0
Coastal Flooding	5	0	0	$0	$0
Total	**36**	**4**	**0**	**$6.050 M**	**$0**

Source: NOAA-NCEI 2020; NHC 2020
- Not recorded in database
** Number of events were collected from NHC and includes events that occurred within 65 nautical miles of Passaic County. Tropical Storm includes one extra-tropical storm*

Between 1954 and 2019, FEMA issued a disaster (DR) or emergency (EM) declaration for the State of New Jersey for 33 coastal storm-related events, classified as one or a combination of the following disaster types: hurricane, tropical storm, severe storm, flooding, Nor'Easter, tropical depression, coastal storm, high tides, and heavy rain. Of those events, Passaic County has been included in five coastal storm-related declarations during this time period (EM and DR) (FEMA 2019).

Table 4.3.1-4. Coastal Storm-Related FEMA Declarations for Passaic County, 1954 to 2019

FEMA Declaration Number	Date(s) of Event	Event Type	Details
DR-4086	October 26, 2012 – November 8, 2012	Hurricane	New Jersey Hurricane Sandy
EM-3354	October 26, 2012 – November 8, 2012	Hurricane	New Jersey Hurricane Sandy
DR-4048	October 28, 2011	Severe Storm	New Jersey Severe Storm
DR-4021	August 27, 2011 – September 5, 2011	Hurricane	New Jersey Hurricane Irene
EM-3332	August 27, 2011 – September 5, 2011	Hurricane	New Jersey Hurricane Irene
DR-1694	April 14, 2007 – April 20, 2007	Severe Storms and Inland and Coastal Flooding	New Jersey Severe Storms and Inland and Coastal Flooding
DR-1295	September 16, 1999 – September 18, 1999	Hurricane	New Jersey Hurricane Floyd
EM-3148	September 16, 1999 – September 18, 1999	Hurricane	New Jersey Hurricane Floyd
DR-701	March 28, 1984 – April 8, 1984	Flooding	New Jersey Coastal Storms, Flooding
DR-477	July 23, 1975	Flooding	New Jersey Heavy Rains, High Winds, Hail, Tornadoes
DR-310	September 4, 1971	Flooding	New Jersey Heavy Rains, Flooding
DR-245	June 18, 1968	Flooding	New Jersey Heavy Rains, Flooding

Source: FEMA 2020, NJ SHMP 2019

Coastal storm events that have impacted Passaic County between 2015 and 2019 are identified in Table 4.3.1-4. For events prior, refer to Appendix E (Risk Assessment Supplement). The annexes in Section 9 provide detailed information regarding impacts and losses to each plan participant.

Table 4.3.1-5. Coastal Storm Events in Passaic County, 2015 to 2019

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Location	Event Details*
June 21, 2015	Tropical Storm Bill	N/A	N/A	Statewide	The remains of Tropical Storm Bill dropped heavy rain but caused no damage.
June 23, 2015	Severe Storm	DR-4231	No	Passaic County	Major Disaster Declaration declared on July 22, 2015
October 28, 2015	Hurricane Patricia	N/A	N/A	Northeast New Jersey	Inches of heavy rain and winds caused downed tree limbs, power outages and flooding throughout the state.
January 22, 2016 – January 24, 2016	Severe Winter Storm and Snowstorm	DR-4264	No	Passaic County	Major Disaster Declaration declared on March 14, 2016
September 5, 2016	Hurricane Hermine	N/A	N/A	Off the Coast	Strong waves and minor coastal flooding occurred along the coastline.
October 8, 2016	Hurricane Matthew	N/A	N/A	Statewide	Brought light rain to the state.
June 24, 2017	Tropical Storm Cindy	N/A	N/A	Statewide	Strong winds caused downed powerlines and trees.
September 3, 2017	Hurricane Harvey	N/A	N/A	Statewide	The remnants of the storm hit the state causing minimal damage.
September 19, 2017	Hurricane Jose	N/A	N/A	Statewide	Large waves caused beach erosion along the shore. Moderate rainfall and winds occurred across the state.
September 27, 2017	Hurricane Maria	N/A	N/A	The Shore	Showers and gusty winds impacted the shore.
March 1, 2018 – March 3, 2018	Nor'Easter	N/A	N/A	Statewide	The northern part of the state reported 10 inches of snow as well as flooding, road closures and power outages.
March 6, 2018 – March 7, 2018	Nor'Easter	DR-4368	Yes	Passaic County	Two to three feet of snow fell and at least one person died from the storm.

Source: FEMA 2019; NCDC 2019; NWS 2014; SPC 2019; NHC 2019, NJ SHMP 2019

** Many sources were consulted to provide an update of previous occurrences and losses; event details and loss/impact information may vary and has been summarized in the above table*

DR Disaster Declaration (FEMA) *Mph miles per hour*

FEMA Federal Emergency Management Agency *N/A Not Applicable*

Probability of Future Occurrences

It is estimated that Passaic County will continue to experience direct and indirect impacts of coastal storms annually that may induce secondary hazards such as flooding, extreme wind, coastal erosion, storm surge in coastal areas, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents, and inconveniences.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for coastal storms in the county is considered "frequent".

Coastal Erosion

In New Jersey, coastal erosion will continue to be an on-going problem along the coastline. It is difficult to assign a probability to the near constant small, on-going erosion that may occur over a continuous period of time. However, a probability can be assigned to larger storm events such as Nor'Easters and hurricanes, which can result in significant, rapid coastal erosion.

Hurricane and Tropical Storms

Hurricane return periods are the frequency at which a certain intensity of hurricane can be expected within a given distance of a given location. For example, a return period of 20 years for a major hurricane means that on average during the previous 100 years, a Category 3 or greater hurricane passed within 58 miles of a specific location approximately 5 times. According to the NHC, the return period of hurricanes for Passaic County was not calculated. However, the return period for surrounding counties is 18 to 19 years for a hurricane (greater than 64 mph winds) and 74 to 76 years for a major hurricane (greater than 110 mph winds) (NHC 2014).

Nor'Easter

As with any weather phenomenon, it is nearly impossible to assign probabilities to Nor'Easters, except over the long-term. High activity seasons are when storm activity exceeds the historical 75th percentile. This means that seasons with this number of storms are expected to occur during one out of four years. Lower activity seasons are defined as when storm activity falls below the historical 75th percentile; meaning this number of storms are expected to occur during three out of four years (East Coast Winter Storms 2013).

Coastal Flooding

Typically, greater rainfall amounts and flooding are associated with coastal storms that have a slow forward speed or stall over an area. Coastal flooding is likely to occur in the future alongside coastal storms such as hurricanes, tropical storms and Nor'Easters. It is estimated that Passaic County will continue to experience direct impacts of coastal flooding on occasion, associated with coastal storm events (NWS n.d.).

Climate Change Impacts

Providing projections of future climate change for a specific region is challenging. Shorter-term projections are more closely tied to existing trends making longer-term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes. Coastal areas may be impacted by climate change in different ways. Coastal areas are sensitive to sea-level rise, changes in the frequency and intensity of storms, increase in precipitation, and warmer ocean temperatures. According to the National Aeronautics and Space Administration (NASA), warmer temperatures may lead to an increase in frequency of storms, thus leading to more weather events that cause coastal erosion.

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2019). Most of this warming has occurred since 1970. The State of New Jersey, for example, has observed an increase in average annual temperatures of 1.2°F between the period of 1971-2000 and the most recent decade of 2001-2010 (CATF 2013). Winter temperatures across the Northeast have seen an increase in average temperature of 4°F since 1970 (Northeast Climate Impacts Assessment [NECIA] 2007). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2013). According to a recent state-level analysis, by the middle of the 21st century an estimated 70 percent of summers in this region are anticipated to be hotter than what we now recognize as the warmest summer on record (NOAA NCEI 2019).

According to the NJDEP, New Jersey is experiencing increased intensity, frequency and duration of storm events (NJDEP 2019). Northern New Jersey's 1971-2000 precipitation average was over five inches (12-percent) greater than the average from 1895-1970 (Sustainable Jersey Climate Change Adaptation Task Force [CATF] 2011). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Average annual precipitation is projected to increase in the region by four to 11-percent by the 2050s and five to 13-percent by the 2080s (New York City Panel on Climate Change [NPCC] 2015). Increased rainfall and heavy rainfalls increase the risk of flooding events.

Annual precipitation for New Jersey has been about 8% above average over the last 10 years. The number of extreme precipitation events has also been above average over the last 10 years. During 2010 to 2014, the State experienced the largest number of extreme precipitation events (days with more than 2 inches) compared to any other 5-year period, about 50 percent above the long-term average. Winter and spring precipitation are projected to increase for the 21st century; extreme precipitation is also projected to increase. The projections of increasing precipitation are characteristic of a large area of the Northern Hemisphere in the northern middle latitudes, as well as increases in heavy precipitation events. This may result in increased coastal and inland flooding risks throughout the State (NCEI 2019).

Some climatologists predict that climate change may play a role in the frequency and intensity of Nor'Easters. Two ingredients are needed to produce strong Nor'Easters and intense snowfall: (1) temperatures which are just below freezing, and (2) massive moisture coming from the Gulf of Mexico. When temperatures are far below freezing, snow is less likely. As temperatures increase in the winter months they will be closer to freezing rather than frigidly cold. Future climate change has been predicted to produce more moisture, thus increasing the likelihood that these two ingredients (temperatures just below freezing and intense moisture) will cause more intense snow events.

The 2019 report by Rutgers University, *New Jersey's Rising Seas and Changing Coastal Storms: Report of the 2019 Science and Technological Advisory Panel* indicates that sea level has been steadily rising with sea levels along the New Jersey coastline rising faster than the global average. According to the report, from 1979-2019, sea level rose 8.2 inches (0.7 feet) along the New Jersey coast, compared to a 4.3-inch (0.4 feet) change in global mean sea-level. Under a moderate-emissions scenario that is roughly consistent with current global policies, coastal areas of New Jersey are likely (at least a 66% chance) to see sea level rise of 1.4 to 3.1 feet between 2000 and 2070, and 2.0 to 5.2 feet between 2000 and 2100. It is extremely unlikely (less than a 5% chance) that sea level rise will exceed 3.8 ft by 2070 or 6.9 ft by 2100 (Rutgers 2019).

4.3.1.2 Vulnerability Assessment

A probabilistic assessment was conducted for the 100- and 500-year MRPs through a Level 2 analysis in HAZUS-MH v4.2 to analyze the wind hazard associated with coastal storms and provide a range of loss estimates due to wind impacts. Storm surge and sea level rise were also assessed using SLOSH data from NOAA's

National Hurricane Center and NOAA's 1- and 3-foot increment sea level rise data, respectively. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess coastal storm risk.

Impact on Life, Health, and Safety

The impact of a coastal storm on life, health, and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time was provided to residents. All Passaic County residents are exposed to a coastal storm hazard; however, only 1% of the entire population of Passaic County (5,828 people) is located in a Category 4 storm surge inundation area (2013-2017 American Community Survey 5-year Estimate).

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Economically disadvantaged populations are vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and may not have funds to evacuate. The population over the age of 65 is also vulnerable and, physically, they may have more difficulty evacuating. Additionally, the elderly are considered vulnerable because they require extra time or outside assistance during evacuations and are more likely to seek or need medical attention which may not be available due to isolation during a storm event. Please refer to Section 3 (County Profile) for the statistics of these populations.

Residents may be displaced or require temporary to long-term sheltering. In addition, downed trees, damaged buildings and debris carried by high winds can lead to injury or loss of life. Socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. HAZUS-MH v4.2 estimates there will be zero displaced households and no people will require temporary shelter due to a 100-year MRP event or a 500-year MRP event. Please note that estimates are only based on wind speed and do not account for sheltering needs associated with flooding and storm surge that may accompany coastal storm events.

The loss associated with coastal storms can vary across the County; secondary flooding associated with the torrential downpours during hurricanes/tropical storms is also a primary concern in the County (refer to the flooding discussion in Section 4.3.7 - Flood). The estimated population living in the Category 1 through 4 SLOSH inundation zones is summarized in Table 4.3.1-6 by municipality. The City of Passaic and the City of Clifton have residents located in storm surge inundation zones.

Table 4.3.1-6. Estimated Population in the Hurricane Storm Surge Inundation Zones

Municipality	Total Population (2013-2017 ACS 5-year)	Estimated Population in SLOSH Inundation Zones							
		Cat 1	% Pop in Cat 1	Cat 2	% Pop in Cat 2	Cat 3	% Pop in Cat 3	Cat 4	% Pop in Cat 4
Bloomingdale, Borough of	8,139	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Clifton, City of	86,207	0	0.0%	0	0.0%	65	0.1%	110	0.1%
Haledon, Borough of	8,440	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Hawthorne, Borough of	19,065	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Little Falls, Township of	14,524	0	0.0%	0	0.0%	0	0.0%	0	0.0%
North Haledon, Borough of	8,564	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passaic, City of	71,057	0	0.0%	334	0.5%	3,377	4.8%	5,718	8.0%

Municipality	Total Population (2013-2017 ACS 5-year)	Estimated Population in SLOSH Inundation Zones							
		Cat 1	% Pop in Cat 1	Cat 2	% Pop in Cat 2	Cat 3	% Pop in Cat 3	Cat 4	% Pop in Cat 4
Paterson, City of	147,890	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Pompton Lakes, Borough of	11,205	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Prospect Park, Borough of	5,955	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ringwood, Borough of	12,451	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Totowa, Borough of	10,829	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wanaque, Borough of	11,782	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wayne, Township of	55,154	0	0.0%	0	0.0%	0	0.0%	0	0.0%
West Milford, Township of	26,759	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Woodland Park, Borough of	12,542	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passaic County (Total)	**510,562**	**0**	**0.0%**	**334**	**0.1%**	**3,442**	**0.7%**	**5,828**	**1.1%**

Source: American Community Survey 5-year Estimate (2013-2017) and NWS 2016

% Percent Cat Category Hurricane
Pop Population SLOSH Sea – Lake Overland Surge from Hurricanes

Exposure to the 1-foot and 3-foot sea level rise events were estimated for the Passaic County population. The analysis found that there are no persons living within these sea level rise hazard areas.

Impact on General Building Stock

Wind-Only Impacts

Damage to buildings is dependent upon several factors, including wind speed, storm duration, and path of the storm track. Building construction also plays a major role in the extent of damage resulting from a coastal storm. Due to differences in construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. Mobile/manufactured homes, and structures constructed of wood and masonry buildings, in general, tend to experience more damage than concrete or steel buildings.

To better understand these risks, HAZUS-MH v4.2 was used to estimate the expected wind-related building damages. Specific types of wind damages are also summarized in HAZUS-MH v4.2 at the following wind damage categories: no damage/very minor damage, minor damage, moderate damage, severe damage, and total destruction. Table 4.3.1-7 summarizes the definition of the damage categories.

Table 4.3.1-7. Description of Damage Categories

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
No Damage or Very Minor Damage Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.	≤2%	No	No	No	No	No
Minor Damage Maximum of one broken window, door or garage door. Moderate roof cover loss that	>2% and ≤15%	One window, door, or	No	<5 impacts	No	No

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.		garage door failure				
Moderate Damage Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water.	>15% and ≤50%	> one and ≤ the larger of 20% & 3	1 to 3 panels	Typically 5 to 10 impacts	No	No
Severe Damage Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.	>50%	> the larger of 20% & 3 and ≤50%	>3 and ≤25%	Typically 10 to 20 impacts	No	No
Destruction Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.	Typically >50%	>50%	>25%	Typically >20 impacts	Yes	Yes

Source: HAZUS-MH Hurricane Technical Manual

Table 4.3.1-8 summarizes the building value (structure only) damage estimated for the 100- and 500-year MRP hurricane wind-only events. Less than 1% of the entire building stock may anticipate structural damages up to the 500-year hurricane wind event; refer to Figure 4.3.1-8 and Figure 4.3.1-9 for a distribution of the loss by event.

Table 4.3.1-8. Estimated Losses (Structure Only) for the 100-Year and 500-Year MRP Hurricane-Related Winds

Municipality	Total Replacement Cost Value (All Occupancies)	Estimated Damages All Occupancies				Estimated Residential Damage		Estimated Commercial Damage	
		100-Year	Percent (%) of Total	500-Year	Percent (%) of Total	100-Year	500-Year	100-Year	500-Year
Bloomingdale, Borough of	$1,784,142,939	$302,759	0.0%	$3,122,577	0.2%	$262,771	$2,906,412	$31,347	$125,745
Clifton, City of	$21,649,495,205	$5,889,959	0.0%	$30,630,351	0.1%	$5,301,439	$26,736,614	$276,693	$1,957,911
Haledon, Borough of	$1,708,591,489	$336,174	0.0%	$1,853,281	0.1%	$273,126	$1,552,113	$20,890	$124,705
Hawthorne, Borough of	$4,588,063,085	$1,201,333	0.0%	$7,033,773	0.2%	$1,098,312	$6,424,215	$40,921	$266,709
Little Falls, Township of	$4,633,701,650	$5,731,190	0.1%	$63,481,015	1.4%	$5,565,141	$62,511,903	$95,113	$581,658
North Haledon, Borough of	$2,317,277,271	$850,057	0.0%	$4,835,708	0.2%	$749,544	$4,352,305	$83,379	$385,670
Passaic, City of	$11,948,345,444	$3,468,783	0.0%	$16,624,328	0.1%	$2,629,417	$12,678,815	$437,990	$2,076,775
Paterson, City of	$55,984,762,201	$8,483,051	0.0%	$50,703,907	0.1%	$6,257,954	$35,627,059	$1,666,589	$11,368,949
Pompton Lakes, Borough of	$1,853,779,603	$433,280	0.0%	$3,102,378	0.2%	$388,730	$2,912,944	$27,333	$124,441
Prospect Park, Borough of	$709,318,581	$248,047	0.0%	$1,409,093	0.2%	$237,837	$1,348,063	$7,531	$45,273
Ringwood, Borough of	$2,724,021,483	$357,238	0.0%	$3,602,484	0.1%	$326,460	$3,488,175	$5,311	$19,472
Totowa, Borough of	$6,476,350,669	$1,190,923	0.0%	$6,491,050	0.1%	$939,789	$5,076,686	$121,651	$727,904
Wanaque, Borough of	$2,211,149,264	$385,094	0.0%	$3,561,028	0.2%	$331,174	$3,351,402	$19,248	$78,880
Wayne, Township of	$19,125,773,073	$4,998,698	0.0%	$32,410,962	0.2%	$4,682,416	$30,910,658	$152,085	$759,517
West Milford, Township of	$9,348,319,367	$672,509	0.0%	$10,174,003	0.1%	$672,401	$9,552,425	$0	$203,086
Woodland Park, Borough of	$17,134,672,551	$811,754	0.0%	$4,685,532	0.0%	$722,267	$4,100,109	$63,345	$403,272
Passaic County (Total)	**$164,197,763,874**	**$35,360,852**	**0.0%**	**$243,721,470**	**0.1%**	**$30,438,777**	**$213,529,898**	**$3,049,427**	**$19,249,968**

Source: HAZUS-MH 4.2

Notes:

MRP Mean return period

**The Total Damages column represents the sum of damages for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government) based on replacement cost value.*

The total damage to buildings (structure only) for all occupancy types across the County is estimated to be $35.3 million for the 100-year MRP wind-only event (tropical storm wind speeds), and approximately $243.7 million for the 500-year MRP wind-only event (Category 1 hurricane wind speeds). The majority of these losses are to residential structures. Total dollar damage reflects the overall impact to buildings at an aggregate level.

Figure 4.3.1-8. Density of Losses for Structures (All Occupancies) for the County 100-Year MRP Hurricane (Wind-Only) Event

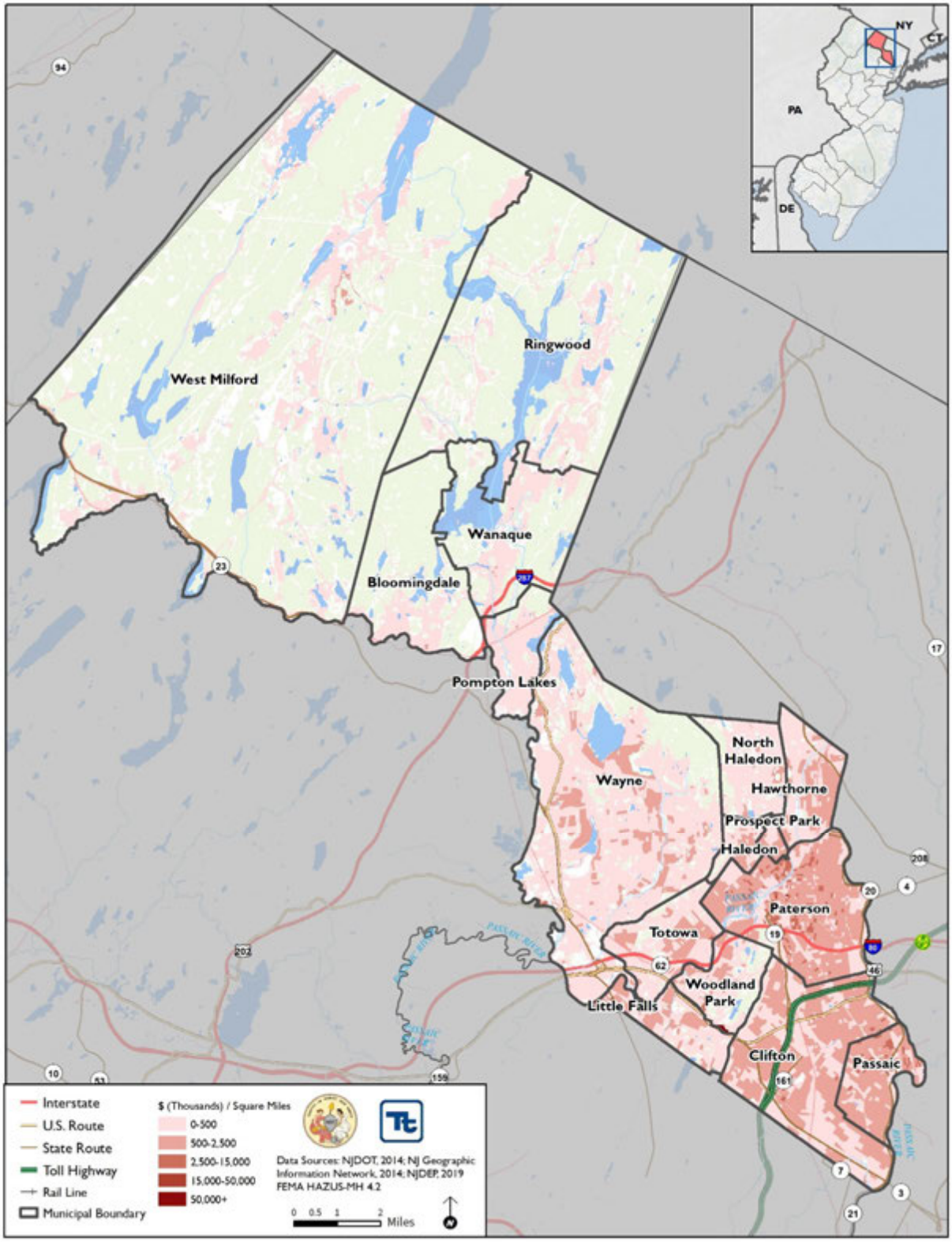
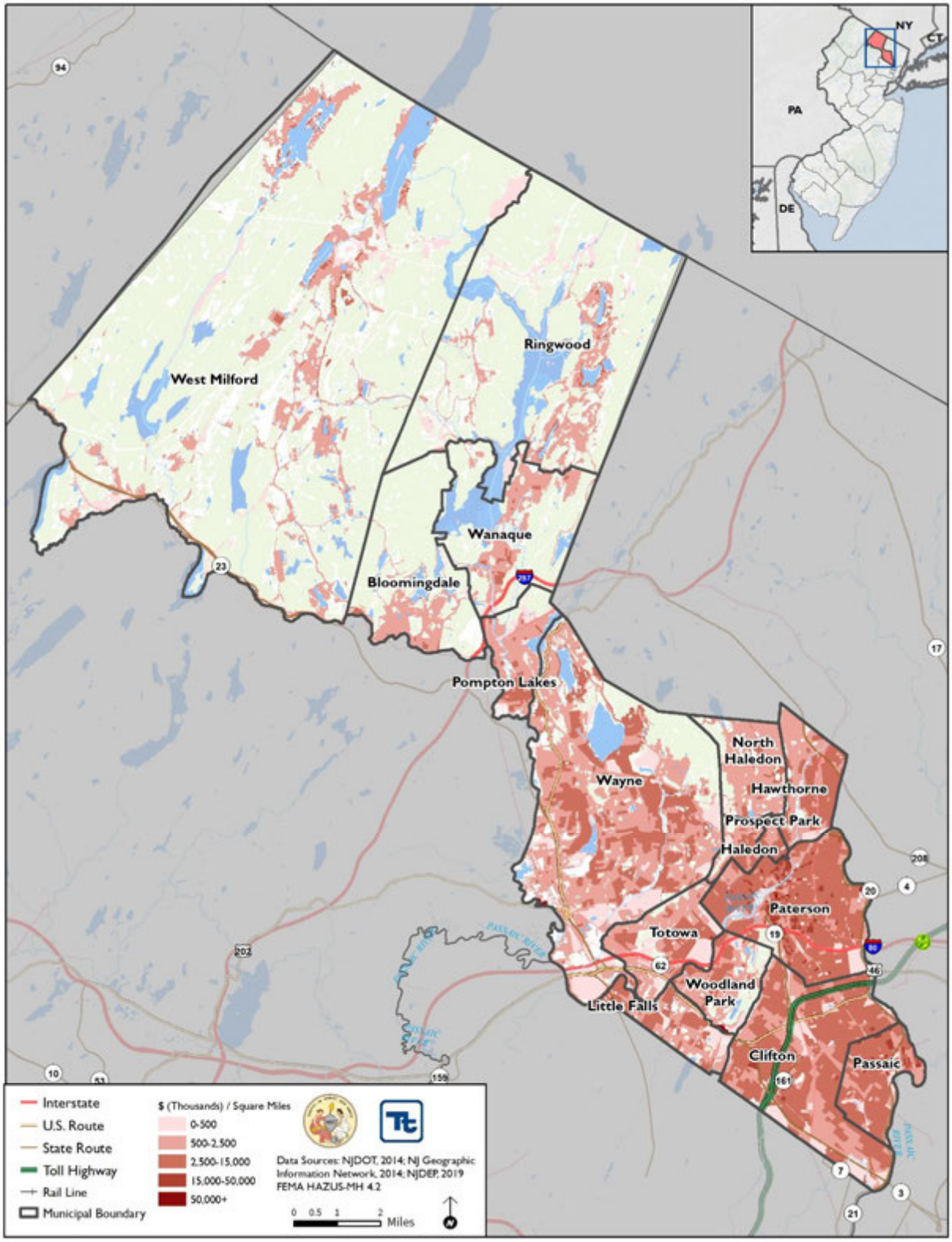


Figure 4.3.1-9. Density of Losses for Structures (All Occupancies) for the County 500-Year MRP Hurricane (Wind-Only) Event



Storm Surge Hurricane and Sea Level Rise Impacts on Buildings

To estimate potential building exposure, the SLOSH inundation zones and sea level rise extents were used. The estimated total number of buildings and replacement cost value located in Categories 1 through 4 SLOSH inundation zones are summarized in Table 4.3.1-9 and Table 4.3.1-10 by municipality. Overall, the City of Passaic has the greatest number of buildings located in Categories 2 through 4 SLOSH inundation zones. The City of Clifton is the only municipality with buildings located in the Category 1 SLOSH inundation zone (i.e., 1 building). The analysis also found that there are no buildings located within the NOAA 1-foot or 3-foot sea level rise extents.

Table 4.3.1-9. Number of Buildings in the Hurricane Inundation Zones

Municipality	Total Number of Buildings	Number of Buildings in SLOSH Inundation Zones							
		Cat 1	% in Cat 1	Cat 2	% in Cat 2	Cat 3	% in Cat 3	Cat 4	% in Cat 4
Bloomingdale, Borough of	2,611	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Clifton, City of	21,859	1	0.0%	6	0.0%	48	0.2%	70	0.3%
Haledon, Borough of	1,809	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Hawthorne, Borough of	5,923	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Little Falls, Township of	3,412	0	0.0%	0	0.0%	0	0.0%	0	0.0%
North Haledon, Borough of	2698	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passaic, City of	6,918	0	0.0%	29	0.4%	224	3.2%	363	5.2%
Paterson, City of	23,609	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Pompton Lakes, Borough of	3,081	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Prospect Park, Borough of	1,101	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ringwood, Borough of	4,486	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Totowa, Borough of	3,771	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wanaque, Borough of	3,157	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wayne, Township of	17,646	0	0.0%	0	0.0%	0	0.0%	0	0.0%
West Milford, Township of	10,794	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Woodland Park, Borough of	3,473	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passaic County (Total)	**116,348**	**0**	**0.0%**	**35**	**0.0%**	**272**	**0.2%**	**433**	**0.4%**

Source: Passaic County, NJGIN MODIV 2018, NJOEM, Microsoft 2018, Open Street Map 2019, and NWS 2016
% = Percent; Cat = Category Hurricane; SLOSH = Sea - Lake Overland Surge from Hurricanes

Table 4.3.1-10. Building Replacement Cost Value in the Hurricane Inundation Zones

Municipality	Total Replacement Cost Value	Value of Buildings in SLOSH Inundation Zones							
		Cat 1	% in Cat 1	Cat 2	% in Cat 2	Cat 3	% in Cat 3	Cat 4	% in Cat 4
Bloomingdale, Borough of	$1,784,142,939	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Clifton, City of	$21,649,495,205	$12,162,600	0.1%	$67,372,778	0.3%	$975,579,374	4.5%	$1,116,121,170	5.2%
Haledon, Borough of	$1,708,591,489	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Hawthorne, Borough of	$4,588,063,085	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Little Falls, Township of	$4,633,701,650	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
North Haledon, Borough of	$2,317,277,271	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Passaic, City of	$11,948,345,444	$0	0.0%	$251,453,173	2.1%	$803,010,444	6.7%	$1,212,580,360	10.1%
Paterson, City of	$55,984,762,201	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Pompton Lakes, Borough of	$1,853,779,603	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Prospect Park, Borough of	$709,318,581	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Ringwood, Borough of	$2,724,021,483	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Totowa, Borough of	$6,476,350,669	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Wanaque, Borough of	$2,211,149,264	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Wayne, Township of	$19,125,773,073	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
West Milford, Township of	$9,348,319,367	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Woodland Park, Borough of	$17,134,672,551	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Passaic County (Total)	$164,197,763,874	$12,162,600	0.0%	$318,825,951	0.2%	$1,778,589,818	1.1%	$2,328,701,530	1.4%

Source: Passaic County, NJGIN MODIV 2018, NJOEM, Microsoft 2018, Open Street Map 2019, RS Means 2019, and NWS 2016

Notes:

% = Percent; Cat = Category Hurricane; SLOSH = Sea - Lake Overland Surge from Hurricane

Impact on Land Uses

A spatial analysis was completed to assess the exposure of the residential and non-residential land uses within the County to storm surge. To estimate the land use located in the Category 1 through Category 4 storm surge inundation zones, the SLOSH boundaries were overlaid upon the USGS land use land cover data for Passaic County to calculate the estimated area of land, broken into residential and non-residential land use types, located in each hazard area. The analysis reviews total acres of the County, regardless if the land is developed or non-developed.

According to the exposure analysis, less than 1% of the County land area is exposed to all storm surge inundation extents (refer to Table 4.3.1-11). Land use land cover data was used to further explore the percent of residential land use versus non-residential land use exposed to storm surge. Non-residential land use incorporates natural land use categories such as open space and forested land cover. Table 4.3.1-12 shows that residential land use is more vulnerable to storm surge exposure throughout the County compared to non-land use areas.

Table 4.3.1-11. Total acres of Passaic County exposed to SLOSH Categories 1 - 4

Total Acres in Passaic County	Exposure to Coastal Storm Flooding	Acres Exposed	% of Total Acres in Passaic County
126,936	CAT 1	5	0.0%
	CAT 2	97	0.1%
	CAT 3	310	0.2%
	CAT 4	458	0.4%

Source: Passaic County, NLCD 2016, NWS 2016

% = Percent; Cat = Category Hurricane; SLOSH = Sea - Lake Overland Surge from Hurricanes

Table 4.3.1-12. Total acres of Passaic County exposed to SLOSH Categories 1 – 4 by Land Use Category

Land Use Type	Total Acres in Passaic County	Exposure to Coastal Storm Flooding							
		CAT 1	% of Total	CAT 2	% of Total	CAT 3	% of Total	CAT 4	% of Total
Residential	28,343	3	0.0%	89	0.3%	279	1.0%	412	1.5%
Non- Residential	98,593	1	0.0%	8	0.0%	29	0.0%	45	0.0%
Total	**126,936**	**5**	**0.0%**	**97**	**0.1%**	**309**	**0.2%**	**457**	**0.4%**

Source: Passaic County, NLCD 2016, NWS 2016

% = Percent; Cat = Category Hurricane; SLOSH = Sea - Lake Overland Surge from Hurricanes

Impact on Critical Facilities

Critical facilities are at risk of being impacted by high winds associated with structural damage, or falling tree limbs/flying debris, which can result in the loss of power. Power loss can greatly impact households, business operations, public utilities, and emergency personnel. For example, vulnerable populations in Passaic County are at risk if power loss results in interruption of heating and cooling services, stagnated hospital operations, and potable water supplies. Emergency personnel such as police, fire, and EMS will not be able to effectively respond in a power loss event to maintain the safety of its citizens. An exposure analysis found that there are no critical

facilities in Passaic County located in the Category 1 SLOSH inundation extent. The critical facilities and utilities located in the Category 2 through 4 inundation zones are summarized Table 4.3.1-13 through Table 4.3.1-15 by municipality. Wastewater pumps and schools are the only two critical facility types exposed to the SLOSH inundation extents.

HAZUS-MH v4.2 estimates the probability that critical facilities (i.e., medical facilities, fire/EMS, police, EOC, schools, shelters and municipal buildings) may sustain damage as a result of 100-year and 500-year MRP winds. Additionally, HAZUS-MH v4.2 estimates the loss of use for each facility in number of days. HAZUS-MH v.2 estimates that the 100-year MRP wind event does not cause damage to the critical facilities. Table 4.3.1-13 summarizes HAZUS-MH v4.2 estimated impacts to critical facilities in Passaic County as a result of the 500-year MRP wind event. Overall, the critical facilities in Passaic County will experience minor damage. To estimate potential building exposure to storm surge, the SLOSH inundation zones were used. There are no critical facilities located in the Category 1 SLOSH Inundation zone.

Table 4.3.1-13. Estimated Impacts to Critical Facilities for the 500-Year MRP Hurricane-Related Winds

Facility Type	500-Year Event				
	Loss of Days	Percent-Probability of Sustaining Damage			
		Minor	Moderate	Severe	Complete
EOC	0	1.1% - 3.8%	0%	0%	0%
Medical	0	0% - 2.5%	0%	0%	0%
Police	0	1.3% - 3.8%	0%	0%	0%
Fire	0	0% - 1.7%	0%	0%	0%
Schools	0	0% - 3.8%	0%	0%	0%

Source: HAZUS-MH 4.2
Notes:
EOC Emergency Operations Center
MRP Mean return period

Table 4.3.1-14. Critical Facilities and Utilities Located in the Category 2 SLOSH Inundation Zones

Municipality*	Facility Type	
	Wastewater Pump	
Clifton, City of	1	
Passaic County (Total)	**1**	

Source: Passaic County, NJOEM
Notes:
SLOSH Sea – Lake Overland Surge from Hurricanes
**Only municipalities within the SLOSH inundation zones are tabulated.*

Table 4.3.1-15. Critical Facilities and Utilities Located in the Category 3 SLOSH Inundation Zones

Municipality*	Facility Type	
	School	Wastewater Pump
Clifton, City of	0	1
Hawthorne, Borough of	0	0
Passaic, City of	1	0
Paterson, City of	0	0
Passaic County (Total)	**1**	**1**

Source: Passaic County, NJOEM
Notes:
SLOSH Sea – Lake Overland Surge from Hurricanes
**Only municipalities within the SLOSH inundation zones are tabulated.*

Table 4.3.1-16. Critical Facilities and Utilities Located in the Category 4 SLOSH Inundation Zones

Municipality*	Facility Type	
	School	Wastewater Pump
Clifton, City of	0	1
Hawthorne, Borough of	0	0
Passaic, City of	2	0
Paterson, City of	0	0
Passaic County (Total)	**2**	**1**

Source: Passaic County, NJOEM
Notes:
SLOSH Sea – Lake Overland Surge from Hurricanes
**Only municipalities within the SLOSH inundation zones are tabulated.*

At this time, HAZUS-MH v4.2 does not estimate losses to transportation lifelines and utilities as part of the hurricane model. Transportation lifelines are not considered particularly vulnerable to the wind hazard; they are more vulnerable to cascading effects such as flooding, falling debris etc. Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting) transportation needs. Furthermore, evacuation routes are vulnerable to coastal storm surge events and hurricane wind events. Evacuation routes generated by the North Jersey Transportation Planning Authority (NJTPA) and major highways from NJDOT were reviewed for level of exposure to the SLOSH Categories 1 through 4 inundation extents. Table 4.3.1-16 summarizes the number of miles highways and evacuation routes are exposed. NJ State Highway 21 is exposed to SLOSH Categories 2 through 4; ranging from 1.2-percent to 9.4-percent of the total miles for highways within the County boundary. There are no evacuation routes exposed to the SLOSH Category inundation extents.

Table 4.3.1-16. Number of Miles Major Transportation Routes are Exposed to SLOSH Categories 1 - 4

Road Type	Total Miles in Passaic County	Exposure to Coastal Storm Flooding							
		CAT 1	% of Total	CAT 2	% of Total	CAT 3	% of Total	CAT 4	% of Total
Highways	55.5	0	0.0%	0.7	1.2%	3.4	6.1%	5.2	9.4%
Evacuation Routes	3.1	0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%

Source: Passaic County, NWS 2016, NJDOT 2016, NJTPA 2019
% = Percent; Cat = Category Hurricane; SLOSH = Sea - Lake Overland Surge from Hurricanes

Sea level rise can also impact critical facilities. For example, sea level rise can create access issues to critical facilities. Not only can the infrastructure leading to the critical facilities become permanently inundated, but the critical facilities themselves can become inundated. An exposure analysis found that there are no critical facilities located in the sea level rise inundation extents.

Impact on Economy

Damage to structures from flooding and wind can be the most immediate result of coastal storm events; however, this damage can have long-lasting impacts on the economy. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. Overall, economic impacts include the loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings. As evidenced by Hurricane Sandy, the State of New Jersey, including Passaic County, lost millions of dollars in wages and economic activity.

HAZUS-MH estimates the total economic loss associated with each storm scenario (direct building losses and business interruption losses). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the "Impact on General Building Stock" section discussed earlier. Business interruption losses are the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event.

For the 100-year MRP wind event, HAZUS-MH v4.2 estimates $115,200 in business interruption costs (income loss, relocation costs, rental costs, and lost wages). For the 500-year MRP wind-only event, HAZUS-MH v4.2 estimates approximately $13.5 million in business interruption losses for the county which includes loss of income, relocation costs, rental costs, and lost wages.

Debris management can be costly and may also impact the local economy. HAZUS-MH estimates the amount of building and tree debris that may be produced as result of the 100- and 500-year MRP wind events. Because the estimated debris production does not include flooding, this is likely a conservative estimate and may be higher if

multiple impacts occur. According to the HAZUS-MH Hurricane User Manual, estimates of weight and volume of eligible tree debris consist of downed trees that would likely be collected and disposed at public expense. Refer to the User Manual for additional details regarding these estimates. Table 4.3.1-17 summarizes debris production estimates for the 100- and 500-year MRP wind events.

Table 4.3.1-17. Debris Production for 100- and 500-Year MRP Hurricane-Related Winds

Municipality	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100 Year	500 Year	100 Year	500 Year	100 Year	500 Year	100 Year	500 Year
Bloomingdale, Borough of	0	233	0	0	65	3,385	686	33,895
Clifton, City of	284	3,034	0	0	442	2,794	5,523	27,977
Haledon, Borough of	15	168	0	0	27	316	317	3,169
Hawthorne, Borough of	33	586	0	0	56	693	796	6,941
Little Falls, Township of	779	8,578	0	0	119	882	1,333	8,824
North Haledon, Borough of	35	391	0	0	58	1,347	611	13,434
Passaic, City of	308	2,056	0	0	136	748	1,646	7,581
Paterson, City of	861	6,210	0	0	170	1,476	3,054	15,075
Pompton Lakes, Borough of	1	245	0	0	31	665	433	6,661
Prospect Park, Borough of	3	106	0	0	1	103	101	1,078
Ringwood, Borough of	0	221	0	0	90	5,341	933	53,321
Totowa, Borough of	69	592	0	0	193	1,197	2,191	12,021
Wanaque, Borough of	0	243	0	0	51	2,590	669	25,979
Wayne, Township of	130	2,410	0	0	698	4,664	7,291	46,582
West Milford, Township of	0	616	0	0	617	10,789	6,477	108,028
Woodland Park, Borough of	39	470	0	0	38	626	547	6,315
Passaic County (Total)	2,557	26,159	0	0	2,792	37,616	32,608	376,883

Source: HAZUS-MH 4.2
Notes:
MRP Mean return period

Impact on the Environment

According to the State of New Jersey 2019 Hazard Mitigation Plan, coastal storms can impact various natural land resources that can be easily uprooted by major wind events and storm surge. Extreme winds from coastal storms may create several tons of debris because the wind tears apart foliage and trees in Passaic County. Plants along waterways may be uprooted from surge causing even further instability and alterations of the shoreline. Consequentially, natural habitat that shelters the County from wind and storm surge can be destroyed, impacting future mitigation (State of New Jersey 2019).

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The interaction between changes in the natural environment such as sea level rise predictions from the 2019 New Jersey Science and Technical Advisory Panel report and changes in the built environment can also provide insight about ways to plan for the future.

As discussed and illustrated in Section 4 and in Figure 4.3.1-10 areas targeted for future growth and development have been identified across the county. Any areas of growth could be potentially impacted by the hurricane and tropical storm hazard because the entire Passaic County Planning Area is exposed and vulnerable to the wind and storm surge hazards associated with these events. The development of new buildings in these areas must meet or exceed the standards in Section R301.2.1.1 of the IBC which will assist with mitigating future potential damages and losses. Areas targeted for potential future growth and development in the next five years have been identified across the county at the jurisdictional level. Refer to the jurisdictional annexes in Volume II of this HMP.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Passaic County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes). According to the data provided by the communities, there are approximately 16 proposed new development projects for Passaic County. While this number of new development projects could be underestimated, the best available data was used to assess future storm surge exposure based on SLOSH Categories 1 through 4. The exposure analysis and Figure 4.3.1-10 shows that none of these new development locations fall within the storm surge hazard area for the SLOSH Categories 1 through 4. Although there are no new development sites proposed to be built within the storm surge hazard areas, projects that are not spatially represented that are built within southern portions of Passaic and Clifton are most at risk of having new development vulnerable to storm surge events (see Figure 4.3.2-12).

Projected Changes in Population

Passaic County has experienced population growth since 2010. According to the U.S. Census Bureau, the County's population has increased 1.9% between 2010 and 2018; a slower growth rate in comparison with the rest of New Jersey (U.S. Census Bureau 2020; Passaic County 2018). The Boroughs of Bloomingdale, Wanaque and Woodland Park have experienced the greatest percentage of growth since 2010; greater than 5% each. Slow population growth suggests that the number of persons impacted by coastal storm hazard areas will minimally change county-wide. However, changes in the density of population when households move throughout the County could influence the number of persons exposed to coastal storm hazard areas. Higher density can not only create issues for local residents during evacuation of a natural hazard event but can also have an effect on commuters that travel into and out of the County for work.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. An increase in temperatures may also lead to an increase in the frequency and intensity of coastal storms. More frequent and severe storms will increase the County's vulnerability to both wind-related and storm surge impacts.

The New Jersey Protecting Against Climate Threats Program has been implemented to minimize the impact of climate related changes (NJDEP 2020). This PACT highlights a series of regulatory action and goals that the State has set for its jurisdictions. Some of the resolutions relate to coastal storms including, issuing sea level rise guidance frameworks, reforming coastal zone management rules, freshwater wetlands rules, and flood hazard control rules.

Furthermore, the New Jersey Science and Technical Advisory Panel (STAP) on Sea-Level Rise and Coastal Storms published a report in 2019 that found New Jersey coastal areas have at least a 66-percent chance of experiencing sea level rise increasing 0.5 to 1.1 feet between 2000 and 2030, but less than 5-percent change of sea level rise exceeding 2.6 feet by 2050 (Rutgers University 2019). However, the study also found that these sea level rise predictions are extremely dependent on future greenhouse gas emissions. If emissions increase, sea level rise will also increase, which can have an impact on coastal communities in New Jersey. Consequentially, sea level rise will affect the baseline for flooding from high tides and coastal storms (Rutgers University 2019). This will exacerbate coastal storm impacts on Passaic County.

Climate is defined not simply as average temperature and precipitation but also by the type, frequency, and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of events like hurricanes. While predicting changes to the prevalence or intensity of hurricanes and the events affects under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society, and the environment (USEPA 2006).

The North Jersey Transportation Planning Authority (NJTPA) recently completed the Passaic River Basin Climate Resilience Planning Study (2019) which assessed the potential for increasingly severe and frequent storm and heat events along with rising sea levels in the Passaic River Basin. The riverine and coastal spatial data generated as a result of this study (25- and 100-year precipitation events for today and planning horizons 2045 and 2080) were used to help understand the change in building exposure as the climate changes. Table 4.3.1-16 through Table 4.3.1-18 summarizes the number of buildings, critical facilities, and population exposed to future projected flood inundation extents, respectively. It is important to note that only the existing 100-year precipitation event in the Passaic River Basin was included in this analysis; not the entire 1-percent annual chance floodplain modeled for this HMP. As summarized in the tables, the climate models anticipate an increase in flood inundation extents in 2045 and 2080 for the 25- and 100-year precipitation events, respectively, leading to an increase in number of buildings and persons exposed.

Table 4.3.1-16. Estimated General Building Stock Exposure to the Existing and Projected 25- and 100-year Precipitation Events

Municipality	25-year Event		100-year		
	Current	2045	Current	2045	2080
Clifton, City of	3	3	3	12	28
Hawthorne, Borough of	15	19	37	68	173
Little Falls, Township of	388	413	490	677	1,425
Passaic, City of	4	37	76	218	465
Paterson, City of	541	694	1,120	1,681	3,783
Prospect Park, Borough of	0	0	3	4	9
Totowa, Borough of	231	278	374	510	1,062
Wayne, Township of	201	212	236	263	545
Woodland Park, Borough of	188	246	382	583	1,206
Building Totals	**1,571**	**1,902**	**2,721**	**4,016**	**8,696**

Source: NJTPA 2019

Table 4.3.1-17. Estimated Critical Facility Exposure to the Existing and Projected 25- and 100-year Precipitation Events

Municipality	25-year Total Exposure				100-year Total Exposure					
	Existing	Existing (Lifelines Only)	2045	2045 (Lifelines Only)	Existing	Existing (Lifelines Only)	2045	2045 (Lifelines Only)	2080	2080 (Lifelines Only)
Clifton, City of	0	0	1	0	1	0	0	0	2	0
Hawthorne, Borough of	0	0	1	1	3	3	0	0	8	6
Little Falls, Township of	1	1	1	1	1	1	0	0	5	5
Passaic, City of	0	0	1	0	1	0	0	0	2	0
Paterson, City of	2	0	3	0	4	0	0	0	23	10
Totowa, Borough of	3	3	4	4	4	4	0	0	11	10
Wayne, Township of	2	1	2	1	2	1	0	0	4	2
Woodland Park, Borough of	3	0	4	0	4	0	0	0	14	0
Critical Facilities Totals	**11**	**5**	**17**	**7**	**20**	**9**	**0**	**0**	**69**	**33**

Source: NJTPA 2019

Table 4.3.1-18. Estimated Population Exposed to the Existing and Projected 25- and 100-year Precipitation Events

Municipality	25-year		100-year		
	Existing Total	2045 Total	Existing Total	2045 Total	2080 Total
Hawthorne, Borough of	5	8	21	37	96
Little Falls, Township of	339	359	421	565	1,185
Passaic, City of	1	21	48	137	294
Paterson, City of	373	481	784	1,178	2,650
Prospect Park, Borough of	0	0	1	2	4
Totowa, Borough of	212	253	341	465	970
Wayne, Township of	164	169	183	198	413
Woodland Park, Borough of	138	188	299	463	963
County Population Total	**1,232**	**1,479**	**2,098**	**3,045**	**6,575**

Source: NJTPA 2019

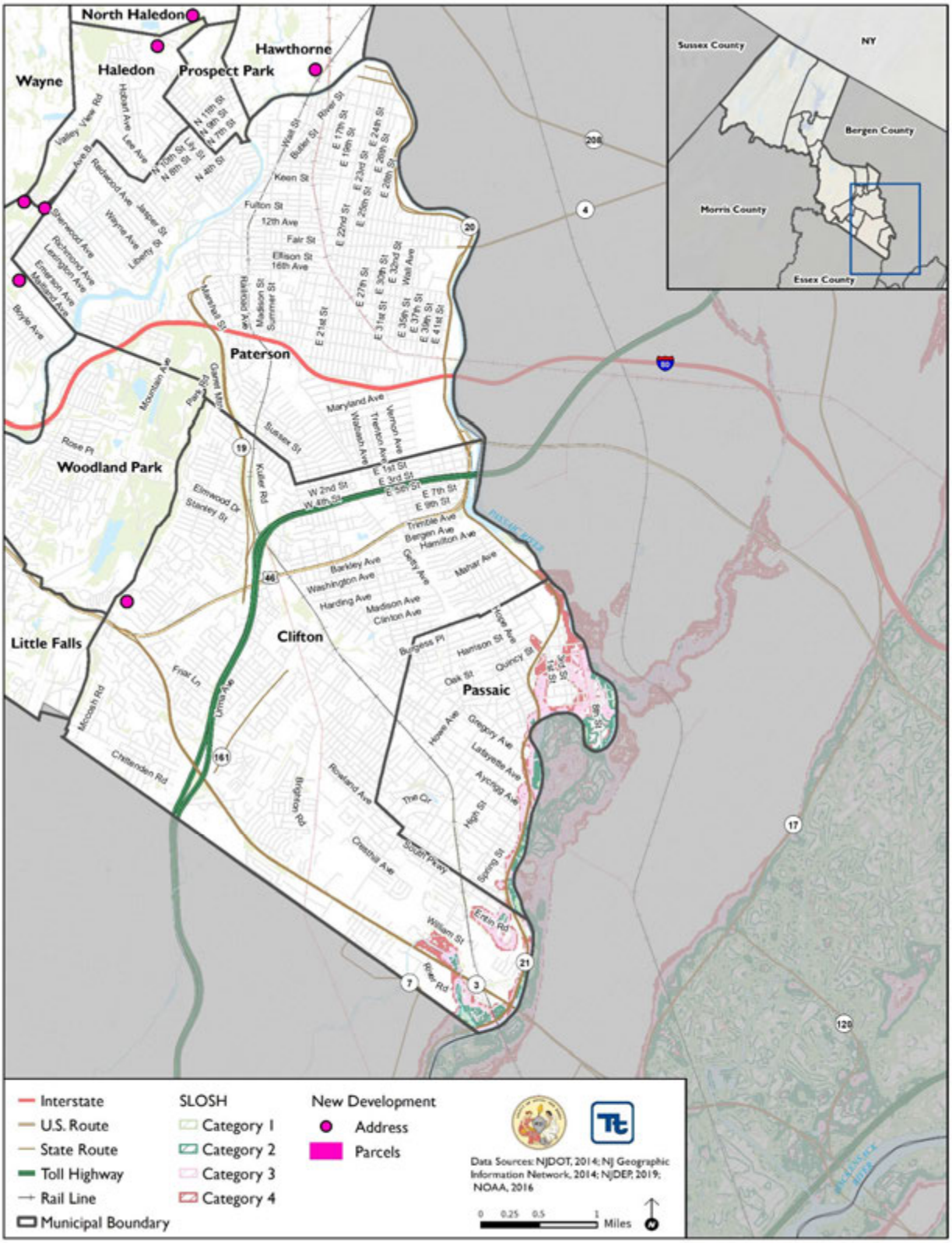
Vulnerability Changes Since the 2015 HMP

There are a few updates that were made since the 2015 HMP was published for Passaic County. Since then, the population statistics were updated to reflect the 2013-2017 American Community Survey 5-year estimates for population changes. The building stock footprints were updated using Microsoft and Open Street Maps. Further, the building stock inventory replacement cost values were updated using RS Means 2019 values, which is a change from the last HMP that used the building stock improvement value from the 2013 tax data. Additional building stock updates include updates to the critical facility inventory provided by Passaic County.

Furthermore, changes to the data modeling were implemented in the updated HMP. An updated version of FEMA's HAZUS-MH hurricane module (version 4.2) was utilized to estimate potential losses. This updated model includes longer historical records to pull from to generate probabilistic events, such as the wind scenario losses generated in this plan. Additionally, the NOAA National Hurricane Center released updated SLOSH inundation boundaries in 2016 that were incorporated into the exposure analysis.

Overall, this vulnerability assessment, using a more accurate and updated building inventory, provides more accurate estimated exposure and potential losses for Passaic County.

Figure 4.3.1-10. Potential New Development in Passaic County and SLOSH



4.3.2 Dam Failure

This section provides a hazard profile and vulnerability assessment for the dam failure hazard in Passaic County.

2020 HMP Changes

- The hazard profile has been significantly enhanced to include a detailed hazard description, location, extent, previous occurrences, probability of future occurrence, and potential change in climate and its impacts on the dam failure hazard is discussed.
- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 1950 and 2019.

4.3.2.1 Profile

Hazard Description

A dam is an artificial barrier that has the ability to store water, wastewater, or liquid-borne materials for many reasons (flood control, human water supply, irrigation, livestock water supply, energy generation, containment of mine tailings, recreation, or pollution control. Many dams fulfill a combination of the stated functions (Association of State Dam Safety Officials 2020).

Dam failures typically occur when spillway capacity is inadequate and excess flow overtops the dam, or when internal erosion (piping) through the dam or foundation occurs. Complete failure occurs if internal erosion or overtopping results in a complete structural breach, releasing a high-velocity wall of debris-filled waters that rush downstream damaging and/or destroying anything in its path (FEMA 1997).

Dam failures can result from one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam
- Deliberate acts of sabotage
- Structural failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams
- Piping and internal erosion of soil in embankment dams
- Inadequate maintenance and upkeep (New Jersey HMP 2019)

Location

The New Jersey Department of Environmental Protection (NJDEP) database identified and classified 155 state-regulated dams in Passaic County; refer to Table 4.3.2-1. Of the 155 dams, 49 have been classified as having 'high hazard potential', meaning their failure may cause the probable loss of life or extensive property damage. It is important to note the classification is based on the consequences of dam failure and not the condition, probability or risk of failure itself.

Table 4.3.2-1. Number of Dams in Passaic County

High Hazard	Significant Hazard	Low Hazard	Other	Total
49	23	61	22	155

Source: New Jersey HMP 2019

In addition, NJDEP identifies 22 'other structures' in Passaic County. These structures are not technically dams within their database. These include dams that are less than 5 feet, have been removed, never built, failed, etc.

Passaic County considers the location of dams as sensitive information; therefore, a map is not displayed and the number and classification of dams in each municipality is not listed in the plan.

Extent

The extent or magnitude of a dam failure event can be measured in terms of the classification of the dam. Additionally, there are two factors that influence the potential severity of a full or partial dam failure are: (1) the amount of water impounded; and (2) the density, type, and value of development and infrastructure located downstream (Association of State Dam Safety Officials 2020).

FEMA, USACE and NJDEP all have classification systems for dams. Please refer to *Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams* (2004) and *Safety of Dams – Police and Procedures* (2014) for an explanation of the FEMA and USACE classifications.

The New Jersey Department of Environmental Protection (NJDEP) assigns one of four hazard classifications to state-regulated dams in New Jersey. The classifications relate to the potential property damage and/or loss of life in the event of a dam failure.

- Class I (High-Hazard Potential) - Failure of the dam may result in probable loss of life and/or extensive property damage
- Class II (Significant-Hazard Potential) - Failure of the dam may result in significant property damage; however loss of life is not envisioned.
- Class III (Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life and/or significant property damage.
- Class IV (Small-Dam Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life or significant property damage. Dam must also meet the requirements of a Class IV dam above.

It is required by the State of New Jersey that all High Hazard and Significant Hazard dams must have NJDEP-approved Emergency Action Plans (EAP) in place. It is the responsibility of the dam owner to review and update the EAP on an annual basis. New Jersey Dam Safety Standards also require inspections to identify conditions that may adversely affect the safety and functionality a dam its appurtenant structures; to note the extent of deterioration as a basis for long term planning, periodic maintenance or immediate repair; to evaluate conformity with current design and construction practices; and to determine the appropriateness of the existing hazard classification. Inspection guidelines are summarized in Table 4.3.2-2. Complete inspection and operating requirements for dams can be found in the New Jersey Dam Safety Standards (N.J.A.C. 7:20-1.11).

Table 4.3.2-2. New Jersey Dam Inspection Requirements

Dam Size/Type	Regular Inspection	Formal Inspection
Class I (High Hazard) Large Dam	Annually	Once every 3 years
Class I (High Hazard) Dam	Once every 2 years	Once every 6 years
Class II (Significant Hazard) Dam	Once every 2 years	Once every 10 years
Class III (Low Hazard) Dam	Once every 4 years	Only as required
Class IV (Zero Hazard) Dam	Once every 4 years	Only as required

Source: N.J.A.C. 7:20-1.11

In New Jersey, every dam in the State as defined in the Safe Dam Act, N.J.S.A. 58:4 is required to meet State dam safety standards. Dam Safety Laws provide the NJDEP with enforcement capabilities to achieve statewide compliance with dam safety standards. This includes issuing orders for compliance to dam owners, and pursuing legal action if the owner does not comply (with the goal of compliance and possible fines levied on a per-day basis for violations) (NJDEP 2017).

Previous Occurrences and Losses

As stated in the 2019 New Jersey State HMP, dam failures can occur suddenly, without warning, and may occur during normal operating conditions. This is referred to as a "sunny-day" failure. Dam failures may also occur during a large storm event. Significant rainfall can quickly inundate an area and cause floodwaters to overwhelm a reservoir. If the spillway of the dam cannot safely pass the resulting flows, water will begin flowing in areas not designed for such flows, and a failure may occur. New Jersey has seen significant property damage including damage or loss of dams, bridges, roads, and buildings as a result of storm events and dam failures (New Jersey HMP 2019).

Between 1954 and 2019, FEMA has not included New Jersey in any dam failure-related disasters (DR) or emergencies (EM). Passaic County has experienced dam failures in the past, mainly due to the impacts from severe weather impacts. According to the New Jersey DEP Bureau of Dam Safety, on September 16, 1999, Hurricane Floyd (Tropical Storm strength by the time it hit New Jersey) caused damage to five dams in West Milford Township (NJDEP 2020). None of these dams experienced complete failure.

Probability of Future Occurrences

Dam failure events are infrequent and usually coincide with events that cause them, such as earthquakes, landslides, and excessive rainfall and snowmelt. As noted, dam failures typically occur in New Jersey as a result of heavy rains or other precipitation. There is a "residual risk" associated with dams. Residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of any type of dam failure is low in today's dam safety regulatory and oversight environment (New Jersey State HMP 2019).

In Section 4.3, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for dam failure in the County is considered 'occasional'.

Climate Change

New Jersey has become wetter over the past century. Northern New Jersey's 1971-2000 precipitation average was over five inches (12-percent) greater than the average from 1895-1970 (Sustainable Jersey Climate Change Adaptation Task Force [CATF] 2011). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Average annual precipitation is projected to increase in the region by four to 11-percent by the 2050s and five to 13-percent by the 2080s (New York City Panel on Climate Change [NPCC] 2015).

As described in the State HMP, dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hygrograph changes, it is conceivable that the dam can lose some or its entire designed margin of safety, also known as freeboard. Loss of designed margin of safety may cause floodwaters more readily to overtop the dam or create unintended loads. Such situations could lead to a dam failure (State HMP 2019).

4.3.2.2 Vulnerability Assessment

Dam failure inundation maps and downstream hazard areas are considered sensitive information and are not made available in the Passaic County HMP. To assess Passaic County's risk to dam failure, a qualitative review was implemented and supplemented with information from Section 4.3.7 (Flood) from this HMP.

Impact on Life, Health and Safety

The impact of dam and levee failure on life, health, and safety is dependent on several factors such as the class of dam/levee, the area that the dam/levee is protecting, the location of the dam/levee, and the proximity of structures, infrastructure, and critical facilities to the dam or levee structure. According to the State HMP, the level of impact that a failure would have can be predicted based upon the hazard potential classification as rated by the United States Army Corps of Engineers (State of NJ 2019). Table 4.3.2-3 outlines the recommended hazard classifications.

Table 4.3.2-3. United States Army Corps of Engineers Hazard Potential Classification

Hazard Category(a)	Direct Loss of Life (b)	Lifeline Losses (c)	Property Losses (d)	Environmental Losses
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss-of-life potential is based on inundation mapping of area downstream of the project. Analyses of loss-of-life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Lifeline losses include indirect threats to life caused by the interruption of lifeline services from project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Property losses include damage to project facilities and downstream property and indirect impact from loss of project services, such as impact from loss of a dam and navigation pool, or impact from loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: State of NJ 2019

The entire population residing within a dam failure inundation zone is considered exposed and vulnerable to an event. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living within these areas. Those most at risk include the economically disadvantaged and the population over the age of 65. According to the 2017 5-year American Community Survey population data, there are 86,667 persons living below the poverty level and 69,429 persons over the age of 65 within Passaic County. These populations are more at risk during a dam failure event because economically disadvantaged populations are likely to evaluate their risk and make the decision to evacuate based upon the net economic impact to their family, while elderly populations are likely to seek or need medical attention. The availability of medical attention may be limited due to isolation during a flood event and other difficulties in evacuating.

There is often limited warning time for a dam failure event. Populations without adequate warning of the event are highly vulnerable.

Impact on General Building Stock

Buildings located downstream of a dam are at risk to damages should there be a failure. Downstream inundation areas were not available to quantify any potential losses to structures. Properties located closest to the dam inundation area have the greatest potential to experience the largest, most destructive surge of water. The overall impact of flooding damages caused by dam failure will vary depending on the depth of flooding and velocity of the surge.

Impact on Critical Facilities

Dam failures may also impact critical facilities and infrastructure located in the downstream inundation zone. Consequentially, dam failure can cut evacuation routes, limit emergency access, and/or create isolation issues. Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Widespread damage to buildings and infrastructure affected by an event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat and utilities are returned to a functioning state. Further, utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

Impact on the Economy

Severe flooding that follows an event like a dam failure can cause extensive structural damage and withhold essential services. The cost to recover from flood damages after a surge will vary depending on the hazard risk of each dam. The State HMP discusses damages from dam failures ranging from $7 million to $25 million as a result of previous events in the State. This cost likely varies because of the density of structures and businesses that surround the protected area.

Severe flooding that follows an event like a dam failure can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur and drinking water and wastewater treatment facilities can become temporarily out of operation. Debris from surrounding buildings can accumulate should the dam mimic major flood events, such as the 1-percent annual chance flood event that is discussed in Section 4.3.7 (Flood).

Impact on the Environment

The environmental impacts of a dam failure can include significant water-quality and debris-disposal issues or severe erosion that can impact local ecosystems. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals may get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties.

Future Changes That May Impact Vulnerability

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Several factors are examined in this section to assess hazard vulnerability.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Passaic County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes). According to the data provided by the communities, there are approximately 16 proposed new development projects for Passaic County. While this number of new development projects could be underestimated, this best available data provides insight about future risk of impacts from dam failure for the County.

Any areas of growth could be potentially impacted by a dam or levee failure event if the structures are located within the flood protection area and mitigation measures are not considered. Therefore, it is the intention of the County and all participating municipalities to discourage development in vulnerable areas or to encourage higher regulatory standards at the local level. Due to the sensitive nature of dam locations and downstream inundation zones, an assessment to determine the proximity of these new development sites to potential dam inundation cannot be performed at this time.

Projected Changes in Population

Passaic County has experienced population growth since 2010. According to the U.S. Census Bureau, the County's population has increased 1.9% between 2010 and 2018; a slower growth rate in comparison with the rest of New Jersey (U.S. Census Bureau 2020; Passaic County 2018). The Boroughs of Bloomingdale, Wanaque and Woodland Park have experienced the greatest percentage of growth since 2010; greater than 5% each. Changes in the density of population when households move throughout the County could influence the number of persons exposed to hazard areas. Higher density can, not only create issues for local residents during evacuation of a dam failure event but can also have an effect on commuters that travel into and out of the County for work, particularly during a flood event that may impact transportation corridors, which are also major commuter roads. Refer to Section 3 (County Profile) for more information about population trends in the County.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to increase the risk to dam failures. Increases in precipitation may stress the dam wall.

Further, existing dams may not be able to retain and manage increases in water flow from more frequent, heavy rainfall events. Heavy rainfalls may result in more frequent overtopping of these dams and flooding of the county's assets in adjacent inundation areas. However, the probable maximum flood used to design each dam may be able to accommodate changes in climate.

Vulnerability Changes Since the 2015 HMP

Overall, the County's vulnerability has not changed and the County will continue to be exposed and vulnerable to dam failure events, especially those located within or near downstream inundation zones. Because of the sensitive nature of the dam failure inundation zones, potential losses have not been quantified and presented in this plan. To estimate potential losses to population, buildings, critical facilities and infrastructure, dam

inundation areas and depths of flooding may be used to generate depth grids. HAZUS-MH may be used to estimate potential losses for the County and participating municipalities.

4.3.3 Disease Outbreak

The following section provides the hazard profile and vulnerability assessment for the disease outbreak hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous events between 2014 and 2019 were researched.
- Due to the emergence of the Coronavirus disease (COVID-19) during this planning process, a brief discussion was added to this section.

4.3.3.1 Profile

Hazard Description

An outbreak or an epidemic occurs when new cases of a certain disease, in a given population, substantially exceed what is expected. An epidemic may be restricted to one locale, or it may be global, at which point it is called a pandemic. Pandemic is defined as a disease occurring over a wide geographic area and affecting a high proportion of the population. A pandemic can cause sudden, pervasive illness in all age groups on a local or global scale. A pandemic is a novel virus to which humans have no natural immunity that spreads from person-to-person. A pandemic will cause both widespread and sustained effects and is likely to stress the resources of both the State and federal government (NJOEM 2019).

Of particular concern in Passaic County are arthropod-borne viruses (arboviruses), which are viruses that are maintained in nature through biological transmission between susceptible hosts (mammals) and blood-feeding arthropods (mosquitos and ticks). More than 100 arboviruses can cause disease in humans; over 30 have been identified as human pathogens in the western hemisphere (New Jersey Department of Health and Senior Services 2008). New Jersey, including Passaic County have been impacted by various past and present infestations including high population of mosquitoes (mosquito-borne diseases) and deer ticks (tick-borne diseases).

Mosquito-borne diseases are diseases that are spread through the bite of an infected female mosquito. The three most common mosquito-borne diseases in New Jersey are: West Nile Virus (WNV), Eastern equine encephalitis (EEE) virus, and St. Louis encephalitis (SLE) virus. These diseases rely on mosquitos to spread. They become infected by feeding on birds carrying the virus; and then spread to humans and other animals when the mosquito bites them (New Jersey Department of Health 2013).

Tick-borne diseases are bacterial illnesses that spread to humans through infected ticks. The most common tick-borne diseases in New Jersey are Lyme disease, Ehrlichiosis, Anaplasmosis, Rocky Mountain Spotted Fever, and Babesiois. These types of diseases rely on ticks for transmission. Ticks become infected by micro-organisms when feeding on small infected mammals (mice and voles). Different tick-borne diseases are caused by different micro-organisms, and it is possible to be infected with more than one tick-borne disease at a time. Anyone who is bitten by an infected tick may get a tick-borne disease. People who spend a lot of time outdoors have a greater risk of becoming infected. The three types of ticks in New Jersey that may carry disease-causing micro-organisms are the deer tick, lone star tick, and the American dog tick (New Jersey Department of Health 2013b).

In addition to arboviruses, Passaic County has been impacted by influenza outbreaks in the past five years. Most recently, the County has been monitoring the Coronavirus (COVID-19). Coronavirus disease (COVID-

19) is an infectious disease first identified in 2019. The virus rapidly spread into a global pandemic by spring of 2020 (WHO 2020).

For the purpose of this HMP Update, the following disease outbreaks will be discussed in further detail: West Nile Virus, Chikungunya, Lyme disease, Human ehrlichiosisis, Rocky Mountain spotted fever, influenza, Enterovirus D68, Hepatitis C, foodborne illnesses, Ebola, measles and Methicillin-resistant Staphylococcus aureus (MRSA). In addition, due to the COVID-19 pandemic that emerged during the development of this plan update, a brief description is described in this section.

Mosquito-Borne Diseases

West Nile Virus

West Nile Virus (WNV) encephalitis is a mosquito-borne viral disease, which can cause an inflammation of the brain. WNV is commonly found in Africa, West Asia, the Middle East and Europe. For the first time in North America, WNV was confirmed in the New York metropolitan area during the summer and fall of 1999. WNV successfully over-wintered in the northeastern U.S. and has been present in humans, horses, birds, and mosquitoes since that time. WNV is spread to humans by the bite of an infected mosquito. A mosquito becomes infected by biting a bird that carries the virus (New Jersey Department of Health 2014).

Chikungunya

Chikungunya is a virus that is spread through mosquito bites. The virus has been found in parts of Africa, southern Europe, Southeast Asia, and islands in the Indian and Pacific Oceans. In 2013, chikungunya was found for the first time in North America and has since spread to the Caribbean, and South and Central America. Symptoms usually begin three to seven days after being bitten by an infected mosquito. The most common symptoms are fever and severe joint pain. Other symptoms may include headache, muscle pain, joint swelling, or rash (CDC 2014).

Tick-Borne Diseases

Lyme Disease

Lyme disease is an illness caused by infection with the bacterium *Borrelia burgdorferi*, which is carried by ticks. The infection can cause a variety of symptoms and, if left untreated, can be severe. Lyme disease is spread to people by the bite of an infected tick. In New Jersey, the commonly infected tick is the deer tick. Immature ticks become infected by feeding on infected white-footed mice and other small mammals. Deer ticks can also spread other tick-borne diseases. Anyone who is bitten by a tick carrying the bacteria can become infected (New Jersey Department of Health 2012b).

Human Ehrlichiosis

Human ehrlichiosisis a disease caused by at least three different ehrlichial species in the United States: *Ehrlichia chaffeensis*, *Ehrlichia ewingii*, and a third *Ehrlichia* species provisionally called *Ehrlichia muris*-like (EML). Ehrlichiae are transmitted to humans by the bite of an infected tick. The lone star tick (Amblyomma americanum) is the primary vector of both Ehrlichia chaffeensis and Ehrlichia ewingii in the United States (CDC 2013).

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever (RMSF) is a tick-borne disease by the bacterium *Rickettsia rickettsi*. This organism is a cause of potentially fatal human illness in North and South America. It is transmitted to humans by the bite of an infected tick. In the United States, these include the American dog tick, Rocky Mountain

wood tick, and the brown dog tick. RMSF can be a severe or even fatal illness if not treated in the first few days of symptoms (CDC 2013).

Influenza

The risk of a global influenza pandemic has increased over the last several years. This disease is capable of claiming thousands of lives and adversely affecting critical infrastructure and key resources. An influenza pandemic has the ability to reduce the health, safety, and welfare of the essential services workforce; immobilize core infrastructure; and induce fiscal instability.

Pandemic influenza is different from seasonal influenza (or "the flu") because outbreaks of seasonal flu are caused by viruses that are already among people. Pandemic influenza is caused by an influenza virus that is new to people and is likely to affect many more people than seasonal influenza. In addition, seasonal flu occurs every year, usually during the winter season, while the timing of an influenza pandemic is difficult to predict. Pandemic influenza is likely to affect more people than the seasonal flu, including young adults. A severe pandemic could change daily life for a time, including limitations on travel and public gatherings (Barry-Eaton District Health Department 2013).

At the national level, the CDC's Influenza Division has a long history of supporting the World Health Organization (WHO) and its global network of National Influenza Centers (NIC). With limited resources, most international assistance provided in the early years was through hands-on laboratory training of in-country staff, the annual provision of WHO reagent kits (produced and distributed by CDC), and technical consultations for vaccine strain selections. The Influenza Division also conducts epidemiologic research including vaccine studies and serologic assays and provided international outbreak investigation assistance (CDC 2011).

Enterovirus D68

Enterovirus D68 (EV-D68) is one of more than 100 non-polio enteroviruses. It was first identified in California in 1962. Since EV-D68 causes respiratory illness, the virus can be found in an infected person's respiratory secretions, such as saliva, nasal mucus, or sputum. EV-D68 likely spreads from person to person when an infected person coughs, sneezes, or touches a surface that is then touched by others. In the United States, people are more likely to get infected with enteroviruses in the summer and fall (CDC 2014).

Hepatitis C Virus

Hepatitis C is a liver disease caused by the hepatitis C virus (HCV). Contact with infected blood spreads the disease. Of 100 HCV-infected people, 75 to 85 will develop chronic (long-lasting) infection and 70 people will eventually develop chronic liver disease. HCV infection is the most common blood borne infection in the United States, affecting nearly three million Americans, most of who do not know they are infected (CDC 2011).

Foodborne Illnesses

Foodborne illness is caused by consuming contaminated foods or beverages. Many different disease-causing microbes or pathogens can contaminate foods, so there are many different types of foodborne illnesses. Foodborne illness, caused by a variety of bacteria, viruses, and parasites, can be spread by consumption of improperly prepared food items, poor hygiene among food handlers, or contamination in food processing facilities or farms. Many foodborne pathogens also can be acquired through recreational or drinking water, from contact with animals or their environment, or through person-to-person spread (New Jersey Department of Health [NJDOH] 2013a).

After eating contaminated food, people can develop anything from a short, mild illness, often mistakenly referred to as "food poisoning," to life-threatening disease. The CDC indicate that foodborne illnesses, each year, result in 76 million becoming ill; more than 300,000 hospitalizations; and 5,000 deaths (NJDOH 2013a). Some of the foodborne diseases in Passaic County recently reported to NJDOH include:

- Campylobacteriosis
- Salmonellosis
- Cyclosporiasis
- Listeriosis

Ebola Virus

Ebola, previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus strains. According to the CDC, the 2014 Ebola epidemic is the largest in history affecting multiple countries in West Africa. Two imported cases, including one death, and two locally-acquired cases in healthcare workers have been reported in the United States. CDC and partners are taking precautions to prevent the further spread of Ebola in the United States (CDC, 2014).

Measles

Measles is a high contagious and serious disease caused by a virus. In 1980, prior to a widespread vaccination, measles caused an estimated 2.6 million deaths every year. It is caused by a virus in the paramyxovirus family and is normally passed through direct contact and through the air. Measles remains as one of the leading causes of death among children globally. Most recently, from January 1 to February 6, 2015, 121 people from 17 states in the United States were reported to have measles, one of which was reported in New Jersey. Currently, the United States is experiencing a multi-state measles outbreak linked to an amusement park in California. From December 28, 2014 to February 6, 2015, 114 from seven states were reported to have measles and are considered to be part of this outbreak (CDC 2015; WHO 2015). As of the date of this plan update, there have been no measles cases reported in Passaic County from 2008 to present.

Methicillin-resistant Staphylococcus aureus

Methicillin-resistant Staphylococcus aureus (MRSA) is a bacteria that is resistant to many antibiotics. Generally, most MRSA infections are skin infections. Typically, it can cause skin and other infections. In a healthcare setting, such as hospitals and nursing homes, MRSA can cause severe problems such as bloodstream infections, pneumonia, and surgical site infections. Anyone can get MRSA through direct contact with an infected wound or by sharing personal items that have touched infected skin (CDC 2013). In New Jersey, single cases of MRSA are not reported; therefore, it is unknown of the number of cases reported in the State and in Passaic County.

Coronavirus

Coronavirus disease (COVID-19) is an infectious disease first identified in 2019. The virus rapidly spread into a global pandemic by spring of 2020. The elderly and those with underlying medical conductions such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness (WHO 2020). With the virus being relatively new, information regarding transmission and symptoms of the virus is emerging from the research. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. Reported illnesses have ranged from mild symptoms to severe illness and death. Reported symptoms include trouble breathing, persistent pain or pressure in the chest, new confusion or inability to arouse, and bluish lips or face. Symptoms may appear 2-14 days after exposure to the virus (based on the incubation period of MERS-CoV viruses) (CDC 2020).

In an effort to slow the spread of the virus, the federal government and States have urged the public to avoid touching of the face, properly wash hands often, and use various social distancing measures. At the time of this plan update, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments (WHO 2020).

Location

Passaic County's geographic and demographic characteristics make it particularly vulnerable to importation and spread of infectious diseases. Densely populated areas will spread diseases quicker than less densely populated areas. Figure 4.3.3-1 shows population density throughout the State. This figure indicates that Passaic County contains many densely populated areas throughout the County and might be more susceptible to infectious diseases like influenza. Additionally, much of the County can experience other diseases such as WNV and chikungunya due to the number of water sources in the County, which provide a breeding ground for infected mosquitos.

Extent

The exact size and extent of an infected population depends on how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more densely populated areas. The transmission rate of infectious diseases will depend on the mode of transmission of a given illness.

The extent and location of disease outbreaks depends on the preferred habitat of the species, as well as the species' ease of movement and establishment. The magnitude of disease outbreaks species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as periods of drought. The already weakened state of the ecosystem causes it to more easily be impacted to an infestation. The presence of disease-carrying mosquitoes and ticks has been reported throughout most of New Jersey and Passaic County.

Mosquito-Borne Diseases

West Nile Virus (WNV)

Since it was discovered in the western hemisphere, WNV has spread rapidly across North America, affecting thousands of birds, horses and humans. WNV swept from the New York City region in 1999 to almost all of the continental U.S., seven Canadian provinces and throughout Mexico and parts of the Caribbean by 2004 (USGS, 2012). Figure 4.3.3-2 shows the activity of WNV over time in North America, from 1999 to 2002.

Figure 4.3.3-1. Passaic Population Density

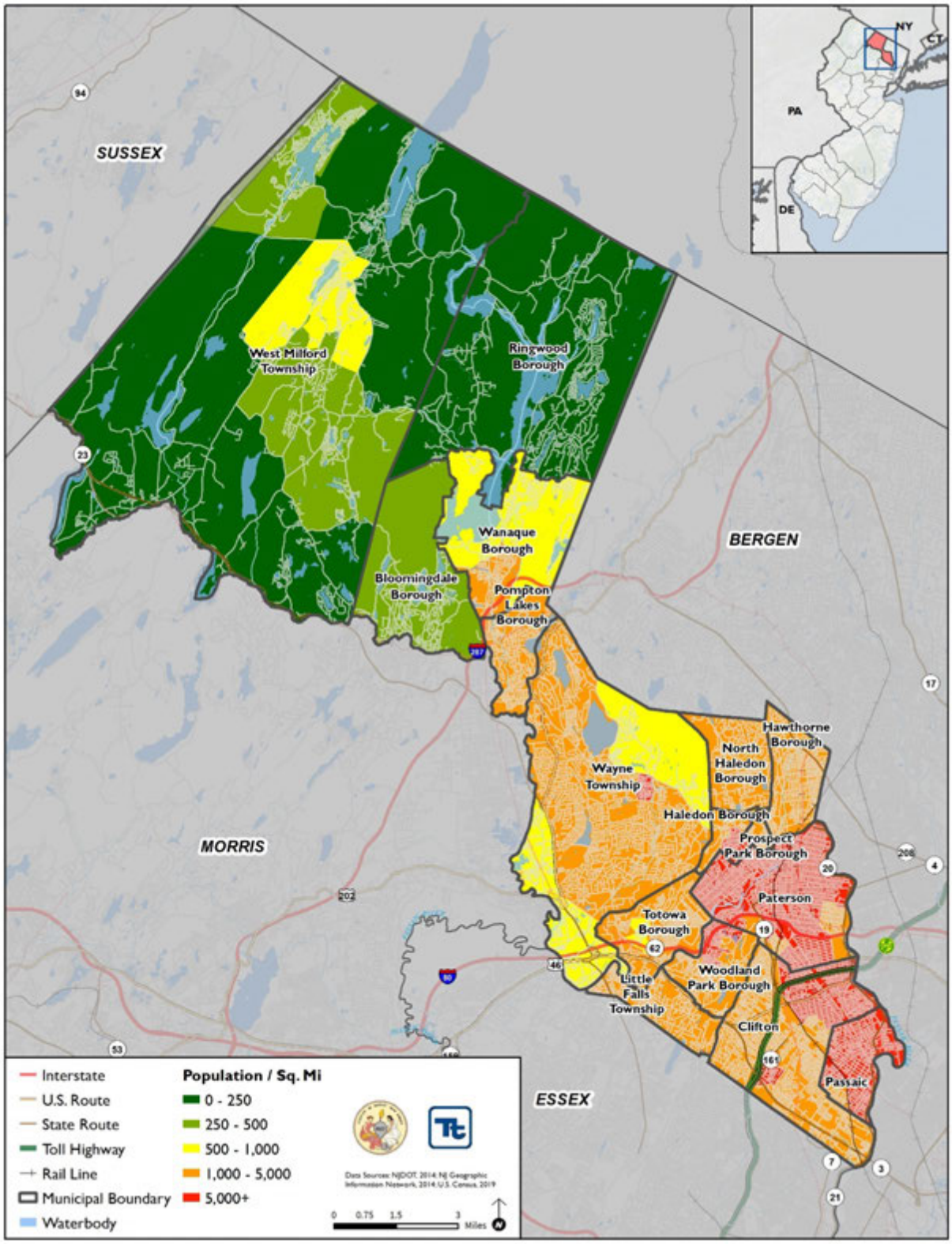
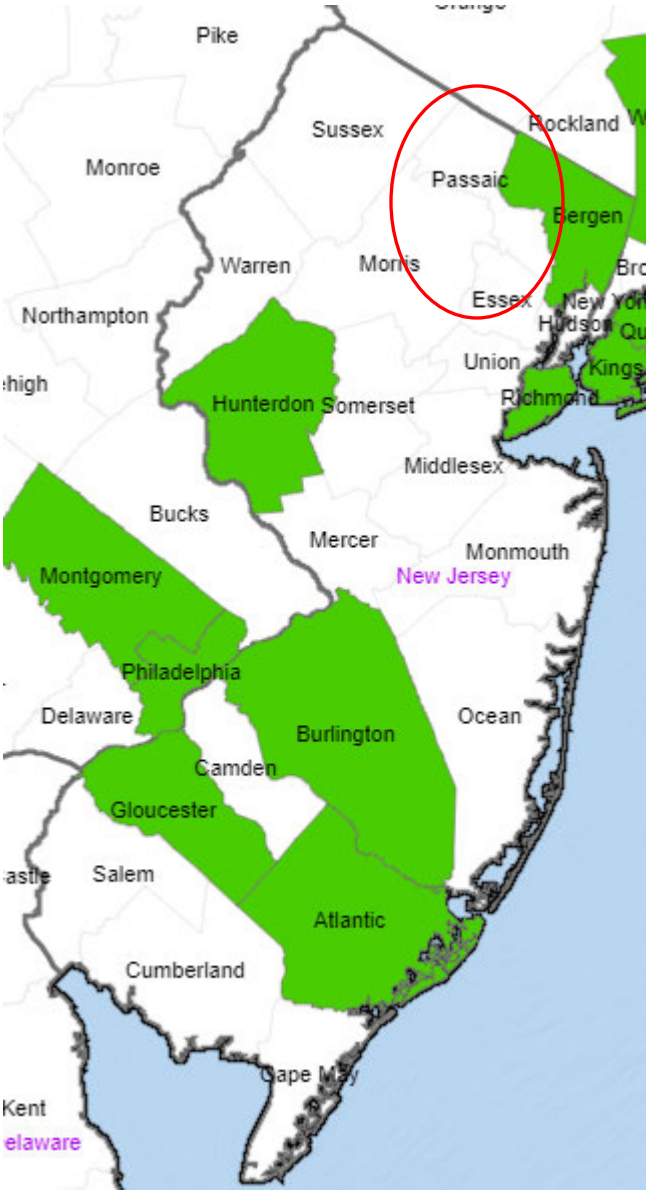


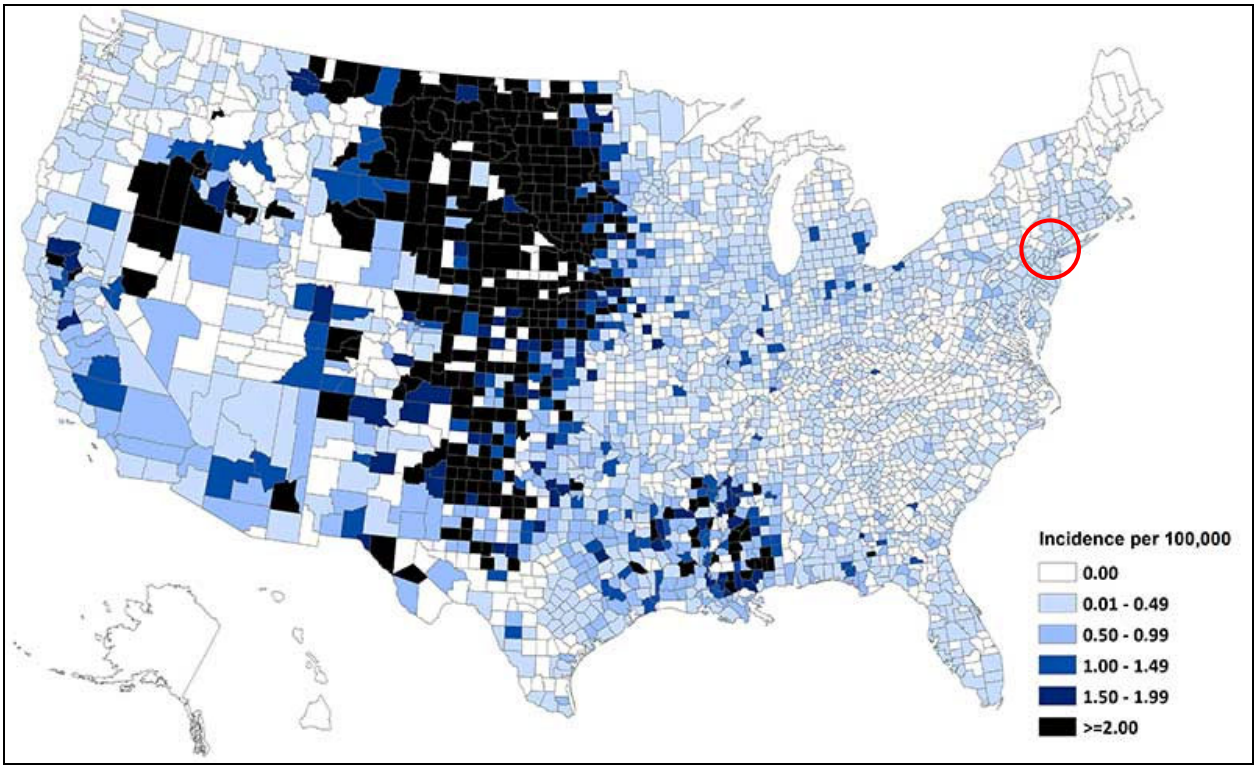
Figure 4.3.3-2. WNV Activity in New Jersey as of January 7, 2020



Source: *CDC 2020*
Note: *Passaic County is located within the red circle.*

The CDC has a surveillance program for WNV. Data is collected on a weekly basis and reported for five categories: wild birds, sentinel chicken flocks, human cases, veterinary cases and mosquito surveillance (CDC, 2011). Figure 4.3.3-3 illustrates WNV activity in the U.S. from 1999-2018.

Figure 4.3.3-3. Average Annual Incidence of West Nile Virus Neuroinvasive Disease Reported to CDC by County, 1999-2018



Source: *CDC 2019*
Note: *The red circle indicates the approximate location of Passaic County. The figure shows Passaic County, on average, experiences between 0.01 and 0.49 per 100,000 reported WNV incidents.*

Chikungunya

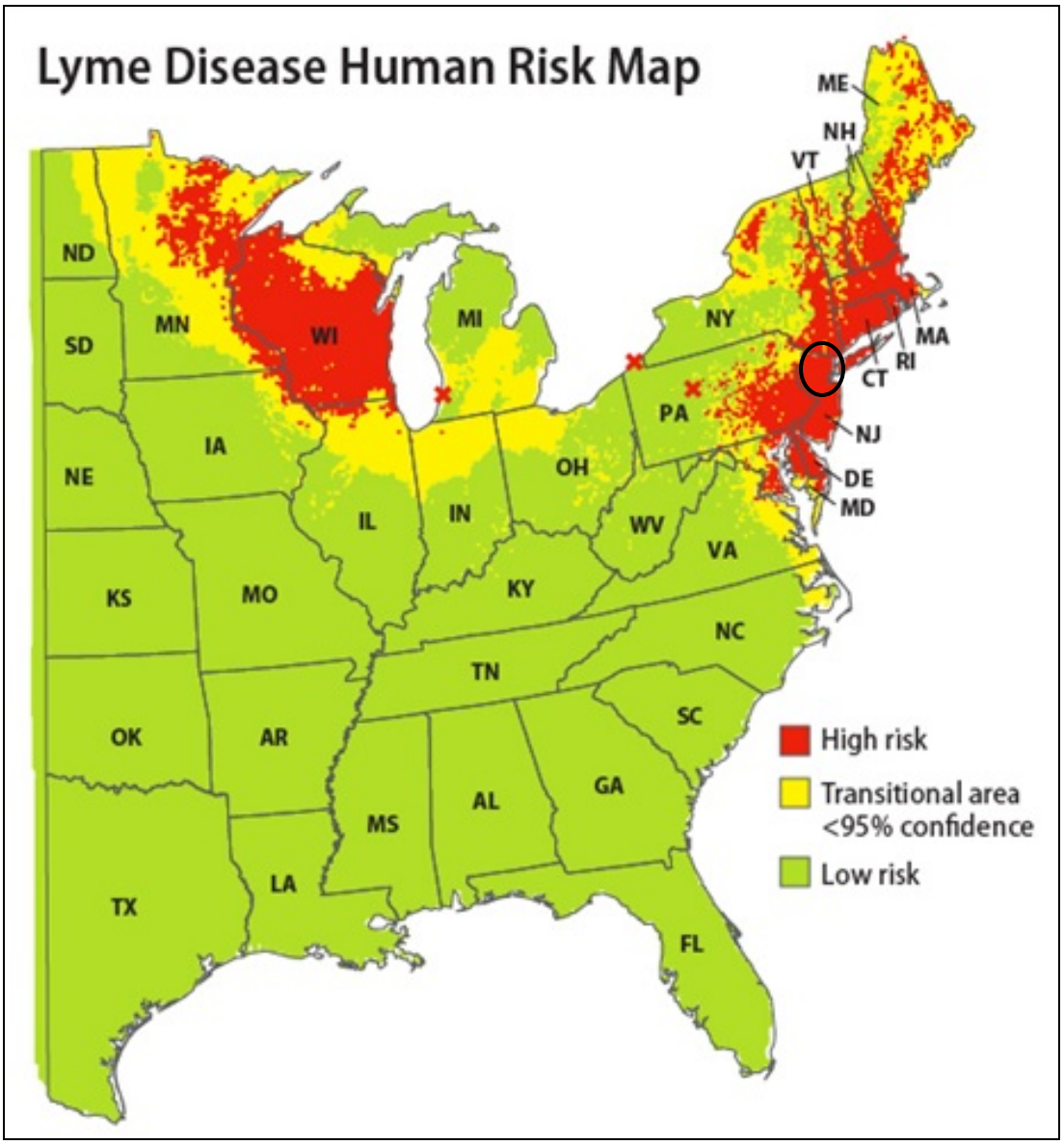
Since 2016, there have been no known reported cases of Chikungunya in Passaic County (NJDEP 2019).

Tick-Borne Diseases

Lyme Disease

Lyme disease is the most commonly reported vector borne illness in the U.S. Between 2014 and 2016, there were 437 confirmed cases of Lyme disease in Passaic County (NJ DOH 2019). Figure 4.3.3-4 shows the risk of Lyme disease in the northeastern U.S. The figure indicates that Passaic County is located in a high-risk area.

Figure 4.3.3-4. Lyme Disease Human Risk Map in the Northeast U.S.



Source: Yale School of Public Health, 2013
Note (1): The approximate location of Passaic County is within the black circle. All of Passaic County located in a high-risk area.

The CDC Division of Vector Borne Diseases (DVBD) indicated in 2018 that New Jersey was the state with the second-highest number of confirmed Lyme disease cases, totaling approximately 2876 cases. For total number of cases between 2007 and 2018, New Jersey ranked third highest for the number of confirmed Lyme disease cases, totaling approximately 32,731 (12.4% of the total reported cases in the U.S.) (CDC 2018).

Human Ehrlichiosis

Since 2018 there have been no known reported cases of Human Ehrlichiosis in Passaic County.

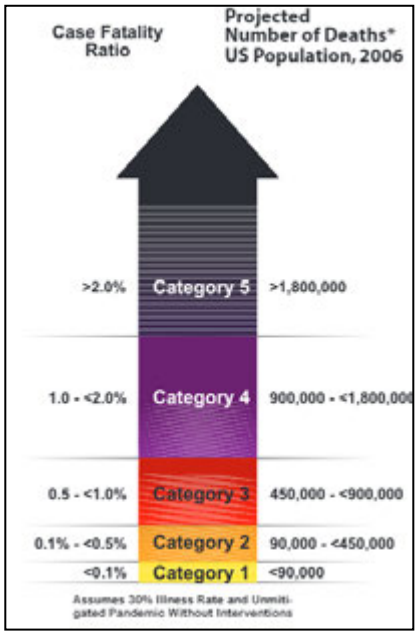
Rocky Mountain Spotted Fever

Since 2018 there have been no known reported cases of Rocky Mountain Spotted Fever in Passaic County.

Influenza, Ebola and Coronavirus

The severity of a pandemic or infectious disease threat in New Jersey will range significantly depending on the aggressiveness of the virus in question and the ease of transmission. Pandemics around the nation have the potential to affect New Jersey's populated areas.

Figure 4.3.3-5. Pandemic PSI



Source: NJDOH 2017

The CDC and Prevention Community Strategy for Pandemic Influenza Mitigation guidance introduced a Pandemic Severity Index (PSI), which uses the case fatality ratio as the critical driver for categorizing the severity of a pandemic. The index is designed to estimate the severity of a pandemic on a population to allow better forecasting of the impact of a pandemic, and to enable recommendations on the use of mitigation interventions that are matched to the severity of influenza pandemic. Pandemics are assigned to one of five discrete categories of increasing severity (Category 1 to Category 5) (NJDOH, 2017). Figure 4.3.2-6 illustrates the five categories of the Pandemic Severity Index (PSI).

In 1999, the WHO Secretariat published guidance for pandemic influenza and defined the six phases of a pandemic. Updated guidance was published in 2005 to redefine these phases. This schema is designed to provide guidance to the international community and to national governments on preparedness and response for pandemic threats and pandemic disease. Compared with the 1999 phases, the new definitions place more emphasis on pre-pandemic phases when pandemic threats may exist in animals or when new influenza virus subtypes infect people but do not spread efficiently. Because recognizing that distinctions between the two interpandemic phases and the three pandemic alert phases may be unclear, the WHO Secretariat proposes that classifications be determined by assessing risk based on a range of scientific and epidemiological data (WHO 2009). The WHO pandemic phases are outlined in Table 4.3.3-1.

Table 4.3.3-1. WHO Global Pandemic Phases

Phase	Description
Preparedness	
Phase 1	No viruses circulating among animals have been reported to cause infections in humans.
Phase 2	An animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans, and is therefore considered a potential pandemic threat.
Phase 3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for example, when there is close contact between an infected person and an unprotected caregiver. However, limited transmission under such restricted circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic.
Response and Mitigation Efforts	
Phase 4	Human infection(s) are reported with a new subtype, but no human-to-human spread or at most rare instances of spread to a close contact.
Phase 5	Characterized by human-to-human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.

Phase	Description
Phase 6	The pandemic phase, is characterized by community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is under way.

Source: WHO 2009

In New Jersey, health and supporting agency responses to a pandemic are defined by the WHO phases and federal pandemic influenza stages, and further defined by New Jersey pandemic situations. The State's situations are similar, but not identical to the United States Department of Homeland Security federal government response stages. Transition from one situation to another indicates a change in activities of one or more New Jersey agencies. Table 4.3.3-2 compares the federal and New Jersey pandemic influenza phases and situations.

Table 4.3.3-2. Federal and New Jersey Pandemic Phases and Situations

Federal Pandemic Influenza Stage		New Jersey Situations	
0	New domestic outbreak in at-risk country (WHO Phase 1, 2, or 3)	1	Novel (new) influenza virus in birds or other animals outside the U.S.
		2	Novel (new) influenza virus in birds or other animals in the U.S./NJ
1	Suspected human outbreak overseas (WHO Phase 3)	3	Human case of novel (new) influenza virus outside of the U.S.
2	Confirmed human outbreak overseas (WHO Phase 4 or 5)	4	Human-to-human spread of novel (new) influenza outside the U.S. (no widespread human transmission)
		5	Clusters of human cases outside the U.S.
3	Widespread human outbreak in multiple locations overseas (WHO Phase 6)		
4	First human case in North America (WHO Phase 6)	6	Human case of novel (new) influenza virus (no human spread) in the U.S./NJ
5	Spread in the U.S. (WHO Phase 6)	7	First case of human-to-human spread of novel (new) influenza in the U.S./NJ
		8	Clusters of cases of human spread in the U.S./NJ
		9	Widespread cases of human-to-human spread of novel (new) influenza outside the U.S./NJ
6	Recovery and preparation for subsequent waves (WHO Phase 5 or 6)	10	Reduced spread of influenza or end of pandemic

Source: NJOEM 2019
NJ New Jersey
U.S. United States
WHO World Health Organization

The COVID-19 pandemic was currently impacting Passaic County at the time the 2020 draft HMP was written. As of June 14, 2020, there were 16,612 confirmed positive cases in the County and 997 deaths from COVID-19.

Enterovirus D68

In the summer and fall of 2014, 1,395 people in 49 states experienced an Enterovirus D68, which is substantially more than a typical year (CDC 2020a). According to the New Jersey Department of Health, Enterovirus D68 is not a reportable disease (NJDOH 2019). Since it is not a reportable disease, it is unknown the number of cases in the State and Passaic County.

Hepatitis C

In 2016, there were an estimated 2.4 million people living with hepatitis C in the United States (CDC 2020b). According to the New Jersey Department of Health, there have been 2,905 reported Hepatitis C from 2014 to 2018 in Passaic County (NJDOH 2019).

Foodborne Illness

According to the New Jersey Department of Health, 155 cases of foodborne illness were reported in 2018 in Passaic County (NJDOH 2019).

Ebola Virus

From 2014 to 2018 there were no known reported cases of Ebola Virus in Passaic County (NJDOH 2019).

Measles

From 2014 to 2018 there have been five confirmed measles cases in Passaic County (NJDOH 2019).

Methicillin-resistant Staphylococcus aureus

In New Jersey, single cases of MRSA are not reported; therefore, it is unknown of the number of cases reported in the State and in Passaic County.

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with disease outbreak events throughout New Jersey and Passaic County. Between 1954 and 2019, FEMA issued a disaster (DR) or emergency (EM) declaration for the State of New Jersey for two disease outbreak-related events (FEMA 2019).

Table 4.3.3-3. Disease Outbreak-Related FEMA Declarations for Passaic County, 1954 to 2019

FEMA Declaration Number	Date(s) of Incident	Incident Type	Incident Title
EM-3156	May 30-November 1,2000	Other	West Nile Virus
DR-4488 / EM-3451	January 20,2000 to present	Pandemic	New Jersey COVID-19 Pandemic

Source: FEMA 2020

For this 2020 HMP update, known disease outbreak events that have impacted Passaic County between 2014 and 2019, with the exception of COVID-19 (which was updated through June 2020) are identified in Table 4.3.3-5.

Table 4.3.3-5. Disease Outbreak Events in Passaic County, 2014 to 2019

Date(s) of Event	Disease Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Event Details*
2014	Camplyobacteriosis	N/A	N/A	In 2014, there were 84 cases of Camplyobacteriosis reported to NJ DOH in Passaic County.
2014	Chikungunya	N/A	N/A	In 2014, there were 27 cases of Chikungunya reported to NJ DOH in Passaic County
2014	Hepatitis C Virus	N/A	N/A	In 2014, there were 478 cases of Hepatitis C Virus reported to NJ DOH in Passaic County
2014	Human Ehrlichiosis	N/A	N/A	In 2014, there were 7 cases of Human Ehrlichiosis reported to NJ DOH in Passaic County
2014	Influenza	N/A	N/A	In 2014, there were 40 cases of influenza, human isolates-type 2009 H1N1; 86 cases of influenza, human isolates-type A (subtyping not done); 25 cases of influenza, human isolates-type A H3; and 106 cases of influenza, human isolates-type B reported to NJ DOH in Passaic County.
2014	Lyme Disease	N/A	N/A	In 2014, there were confirmed 190 cases of Lyme Disease reported to NJ DOH in Passaic County.
2014	Measles	N/A	N/A	In 2014, there was one confirmed cases of Measles reported to NJ DOH in Passaic County.
2014	Rocky Mountain Spotted Fever	N/A	N/A	In 2014, there were three cases of Rocky Mountain Spotted Fever reported to NJ DOH in Passaic County.
2015	Camplyobacteriosis	N/A	N/A	In 2015, there were 138 cases of Camplyobacteriosis reported to NJ DOH in Passaic County.
2015	Chikungunya	N/A	N/A	In 2015, there were 2 cases of Chikungunya reported to NJ DOH in Passaic County
2014	Hepatitis C Virus	N/A	N/A	In 2015, there were 618 cases of Hepatitis C Virus reported to NJ DOH in Passaic County
2015	Human Ehrlichiosis	N/A	N/A	In 2015, there were 7 cases of Human Ehrlichiosis reported to NJ DOH in Passaic County
2015	Influenza	N/A	N/A	In 2015, there were three cases of influenza, human isolates-type 2009 H1N1, 153 cases of influenza, human isolates-type A (subtyping not done); 26 cases of influenza, human isolates-type A H3; and 16 cases of influenza, human isolates-type B reported to NJ DOH in Passaic County.
2015	Lyme Disease	N/A	N/A	In 2015, there were confirmed 244 cases of Lyme Disease reported to NJ DOH reported to NJ DOH in Passaic County.
2015	West Nile Virus	N/A	N/A	In 2015, there was one case of West Nile Virus reported to NJ DOH in Passaic County.
2016	Camplyobacteriosis	N/A	N/A	In 2016, there were 118 cases of Camplyobacteriosis reported to NJ DOH in Passaic County.
2016	Hepatitis C Virus	N/A	N/A	In 2016, there were 631 cases of Hepatitis C Virus reported to NJ DOH in Passaic County

Date(s) of Event	Disease Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Event Details*
2016	Human Ehrlichiosis	N/A	N/A	In 2016, there were 5 cases of Human Ehrlichiosis reported to NJ DOH in Passaic County
2016	Influenza	N/A	N/A	In 2016, there were 104 cases of influenza, human isolates-type 2009 H1N1; 213 cases of influenza, human isolates-type A (subtyping not done); two cases of influenza, human isolates-type A H1; 10 cases of influenza, human isolates-type A H3; and 143 cases of influenza, human isolates-type B reported to NJ DOH in Passaic County.
2016	Lyme Disease	N/A	N/A	In 2016, there were 204 confirmed cases of Lyme Disease reported to NJ DOH in Passaic County.
2016	Rocky Mountain Spotted Fever	N/A	N/A	In 2016, there was two cases of Rocky Mountain Spotted Fever reported to NJ DOH in Passaic County.
2016	West Nile Virus	N/A	N/A	In 2016, there was one case of West Nile Virus reported to NJ DOH in Passaic County.
2017	Camplyobacteriosis	N/A	N/A	In 2017, there were 118 cases of Camplyobacteriosis reported to NJ DOH.
2017	Hepatitis C Virus	N/A	N/A	In 2017, there were 610 cases of Hepatitis C Virus reported to NJ DOH in Passaic County
2017	Human Ehrlichiosis	N/A	N/A	In 2017, there were 4 cases of Human Ehrlichiosis reported to NJ DOH in Passaic County
2017	Influenza	N/A	N/A	In 2017, there were 766 cases of influenza, human isolates-type A (subtyping not done); 78 cases of influenza, human isolates-type A H3; and 241 cases of influenza, human isolates-type B reported to NJ DOH in Passaic County.
2017	Lyme Disease	N/A	N/A	In 2017, there were 615 confirmed cases of Lyme Disease reported to NJ DOH in Passaic County.
2017	Measles	N/A	N/A	In 2018, there was one confirmed cases of Measles reported to NJ DOH in Passaic County.
2018	Camplyobacteriosis	N/A	N/A	In 2018, there were 155 cases of Camplyobacteriosis reported to NJ DOH in Passaic County.
2018	Hepatitis C Virus	N/A	N/A	In 2018, there were 568 cases of Hepatitis C Virus reported to NJ DOH in Passaic County
2018	Human Ehrlichiosis	N/A	N/A	In 2018, there were 3 cases of Human Ehrlichiosis reported to NJ DOH in Passaic County
2018	Influenza	N/A	N/A	In 2018, there were 106 cases of influenza, human isolates-type 2009 H1N1; 1,205 cases of influenza, human isolates-type A (subtyping not done); 75 cases of influenza, human isolates-type A H1; 116 cases of influenza, human isolates-type A H3; and 809 cases of influenza, human isolates-type B reported to NJ DOH in Passaic County.
2018	Lyme Disease	N/A	N/A	In 2018, there were 149 confirmed cases of Lyme Disease reported to NJ DOH in Passaic County.
2018	Measles	N/A	N/A	In 2018, there were three confirmed cases of Measles reported to NJ DOH in Passaic County.

Date(s) of Event	Disease Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Event Details*
2018	West Nile Virus	N/A	N/A	In 2018, there were three WNV human disease cases reported to NJ DOH in Passaic County.
2019	COVID-19	DR-4488	Yes	The COVID-19 pandemic is currently taking place at the time of the HMP update. As of June 14, 2020, there were 16,612 positive cases in Passaic County and 997 deaths.

Source: New Jersey Department of Health 2019; New Jersey Department of Health 2020; Lyme Disease Association 2014; FEMA 2020

** With disease outbreak documentation for New Jersey and Passaic County being so extensive, not all sources have been identified or researched. Therefore, Table 4.3.13-3 may not include all events that have occurred in the County.*

N/A Not Available

WNV West Nile Virus

Probability of Future Occurrences

It is difficult to predict when the next disease outbreak will occur and how severe it will be because viruses are always changing. The Department of Health and Human Services and others are developing supplies of vaccines and medicines. In addition, the United States has been working with the WHO and other countries to strengthen detection of disease and response to outbreaks. Preparedness efforts are ongoing at the national, State, and local level (NJOEM 2019).

In Passaic County, the probability for a future disease outbreak event is dependent on several factors. One factor that influences the spread of disease is population density. Populations that live close to one another are more likely to spread diseases. As population density increases in the County, so too will the probability of a disease outbreak event occurring.

Disease-carrying ticks will continue to inhabit the northeast, including Passaic County, creating an increase in Lyme disease and other types of infections amongst the county population if not controlled or prevented. Ecological conditions favorable to Lyme disease, the steady increase in the number of cases, and the challenge of prevention predict that Lyme disease will be a continuing public health concern. Personal protection measures, including protective clothing, repellents or acaricides, tick checks, and landscape modifications in or near residential areas, may be helpful. However, these measures are difficult to perform regularly throughout the summer. Attempts to control the infection on a larger scale by the eradication of deer or widespread use of acaricides, which may be effective, have had limited public acceptance. New methods of tick control, including host-targeted acaricides against rodents and deer, are being developed and may provide help in the future (Steere, Coburn, and Glickstein, 2004).

Currently and in the future, control of Lyme disease will depend primarily on public and physician education about personal protection measures, signs and symptoms of the disease, and appropriate antibiotic therapy. Based on available information and the ongoing trends of disease-carrying tick populations, it is anticipated that Lyme disease infections will continue to be a threat to Passaic County.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering and Planning Committees, the probability of occurrence for disease outbreaks in the County is considered 'frequent'.

Climate Change Impacts

The relationship between climate change and increase in infectious diseases is difficult to predict with certainty, there are scientific linkages between the two. As warm habitats that host insects such as mosquitoes increase, more of the population becomes exposed to potential virus threats. Waterborne human infections occur by contact with contaminated drinking water, recreational water, or by food. This may be due to human actions, such as improper disposal of sewage, or due to weather events such as rainfall and high temperatures. Rainfall can influence the transport and dissemination of infectious agents, while temperature affects their growth and survival (World Health Organization, 2020).

The notion that rising temperatures will increase the number of mosquitoes that can transmit diseases such as WNV, Zika and malaria among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future (NJOEM 2019).

4.3.3.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard. The following discusses Passaic County's vulnerability, in a qualitative nature, to the disease outbreak hazard.

Impact on Life, Health and Safety

The entire population of Passaic County is vulnerable to the disease outbreak hazard. Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard.

Maintaining certain key functions is important to preserve life and decrease societal disruption during pandemic. Heat, clean water, waste disposal, and corpse management all contribute to public health. Ensuring functional transportation systems also protects health by making it possible for people to access medical care and by transporting food and other essential goods. Critical infrastructure groups have a responsibility to maintain public health, provide public safety, transport medical supplies and food, implement a pandemic response, and maintaining societal functions. If these workers were absent due to pandemic outbreak, these systems will fail (Global Security 2011).

Healthcare providers and first responders have an increased risk of exposure due to their frequent contact with infected populations. Areas with a higher population density also have an increased risk of exposure or transmission of disease due to their proximity to potentially infected people. Further, the elderly and immunocompromised individuals may have increased vulnerability to becoming infected or experience exacerbated impacts depending upon the disease. Refer to Section 3 (County Profile) for summary of the vulnerable populations in Passaic County.

Most recently with COVID-19, the Centers for Disease Control and Prevention have indicated that persons over 65 years and older, persons living in a nursing home or long-term care facility, and persons with underlying medical conditions such as diabetes, severe obesity, serious heart conditions, etc. are at a higher risk of getting severely ill (CDC 2020). Population data from the 2017 5-year American Community Survey indicates that 69,429 persons over 65 years old in Passaic County would be considered at risk for getting severely ill from the COVID-19 virus. While the statistics of this virus are subject to change during the publication of this HMP, the dashboard shows that there is a higher percent of illnesses within the mentioned age group and that Passaic County is within the top five Counties experiencing the greatest number of outbreaks (NJ 2020).

Impact on General Building Stock

No structures are anticipated to be directly affected by disease outbreaks.

Impact on Critical Facilities

While the actual structures of County and municipal buildings, critical facilities, and infrastructure will not be impacted by a pandemic or disease outbreak, the effect of absenteeism on workers will impact local government services. The most significant impact on critical facilities would be the increase in hospitalization and emergency room visits that would take place as a result of the outbreak. This would create a greater demand on these critical facilities, their staff, and resources. CDC's model estimates an increase of more than 25% in the demand for hospitalization and intensive care unit services, even in a 'moderate pandemic' (United States Department of Health and Human Services, 2005).

Mortuary services could be substantially impacted due to the anticipated increased numbers of deaths. The timely, safe, and respectful disposition of the deceased is an essential component of an effective response.

Pandemic influenza may quickly rise to the level of a catastrophic incident that results in mass fatalities, which will place extraordinary demands (including religious, cultural, and emotional burdens) on local jurisdictions and the families of the victims (Global Security 2011).

The healthcare system will be severely taxed, if not overwhelmed, from the large number of illnesses and complications from influenza requiring hospitalization and critical care. CDC models estimate increases in hospitalization and intensive care unit demand of more than 25%. Ventilators will be the most critical shortage if a pandemic were to occur (Global Security 2011).

Impact on Economy

The impact disease outbreaks have on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with the activities and programs implemented to conduct surveillance and address disease outbreaks have not been quantified in available documentation. Instead, activities and programs implemented by the County to address this hazard are described below, all of which could impact the local economy.

In Passaic County, the Health Department has the responsibility for Mosquito Control. Since 2003, Mosquito Control has been a division of the Department of Health. The goal of Mosquito Control is to reduce populations to a manageable level that both preserves the quality of life for the people of Passaic County and reduce the likelihood of disease transmission, while causing as little impact to the environment as possible. Most recently, the Health Department has played an active role in maintaining and controlling COVID-19 protocols across the County. This activity requires additional costs from the State and County to manage COVID-19 in communities. Further, there has been secondary economic impact of closing non-essential facilities to reduce the spread of the virus. The final costs of this virus are still to be determined.

Impact on Environment

Disease outbreaks may have an impact on the environment if the outbreaks are caused by invasive species. Invasive species tend to be competitive with native species and their habitat. One study has shown that invasive mosquitos such as the Asian tiger mosquito, a common invasive mosquito found in New Jersey, have "desiccation-resistant eggs," which means that they have enhanced survival in inhospitable environments (Juliano and Lounibos 2005). This species is considered a competitive predator and will prey on other species of mosquitos and a range of insects disrupting the natural food chain. Invasive species of mosquitos can be the major transmitters of disease like Zika, dengue, and yellow fever (Placer Mosquito and Vector Control District 2019).

Secondary impacts from mitigating disease outbreaks could also have an impact on the environment. Pesticides used to control disease carrying insects like mosquitos have been reviewed by the EPA and department of health. If these sprays are applied in large concentrations, they could potentially leach into waterways and harm nearby terrestrial species. However, there is a law in New Jersey's Pesticide Regulations that states "no person shall distribute, sell, offer for sale, purchase, or use any pesticide which has been suspended or canceled by the EPA, except as provided for in the suspension of cancellation order" (New Jersey nd).

Further Changes that May Impact Vulnerability

Understanding future changes that may impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors that may affect hazard vulnerability:

- Potential or projected development.

- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development and Change in Population

Any areas of growth could be potentially impacted by the disease outbreak hazard because the entire planning area is exposed. As population continues to increase in the County, there may be at increased risk to certain diseases. If the commuter population to and from New York City increases, there may be increased exposure to diseases that emerge first in the more densely populated city. Higher concentrations of persons traveling via public transportation may become more vulnerable to the exchange of disease through airborne transmission.

Changes in population density may influence the number of persons exposed to disease outbreaks. Higher density jurisdictions are not only at risk of greater exposure to disease outbreak, density may also reduce available basic services provided by critical facilities such as hospitals and emergency facilities for persons that are not affected by a disease Further, as the population ages there may be increased risk to this demographic. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from certain diseases, such as COVID-19.

Climate Change

As discussed earlier in this section, the relationship between climate change and increase in infectious diseases is difficult to predict with certainty, however there may be linkages between the two. Changes in the environment may create a more livable habitat for vectors carrying disease as suggested by the Centers for Disease Control and Prevention (CDC n.d.). Localized changes in climate and human interaction may also be a factor in the spread of disease.

The relationship between climate change and infectious diseases is somewhat controversial. The notion that rising temperatures will increase the number of mosquitoes that can transmit malaria among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future. Other factors, such as expanded rapid travel and evolution of resistance to medical treatments, are already changing the ways pathogens infect people, plants, and animals. As climate change accelerates it is likely to work synergistically with many of these factors, especially in populations increasingly subject to massive migration and malnutrition (Harmon 2010).

Vulnerability Change Since the 2015 HMP

Overall the County continues to remain vulnerable to the disease outbreak hazard. Any changes or perceived increase in vulnerability may be attributed to changes in population numbers and density or the emergence of new diseases.

4.3.4 Drought

This section provides a hazard profile and vulnerability assessment for the drought hazard in Passaic County.

2020 HMP Changes

- The hazard profile has been significantly enhanced to include a detailed hazard description, location, extent, previous occurrences, probability of future occurrence, and climate change impacts.
- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 2014 and 2020.
- The County's 2017 5-year American Community Survey population was considered when determining its exposure and vulnerability to the drought hazard.

4.3.4.1 Profile

Hazard Description

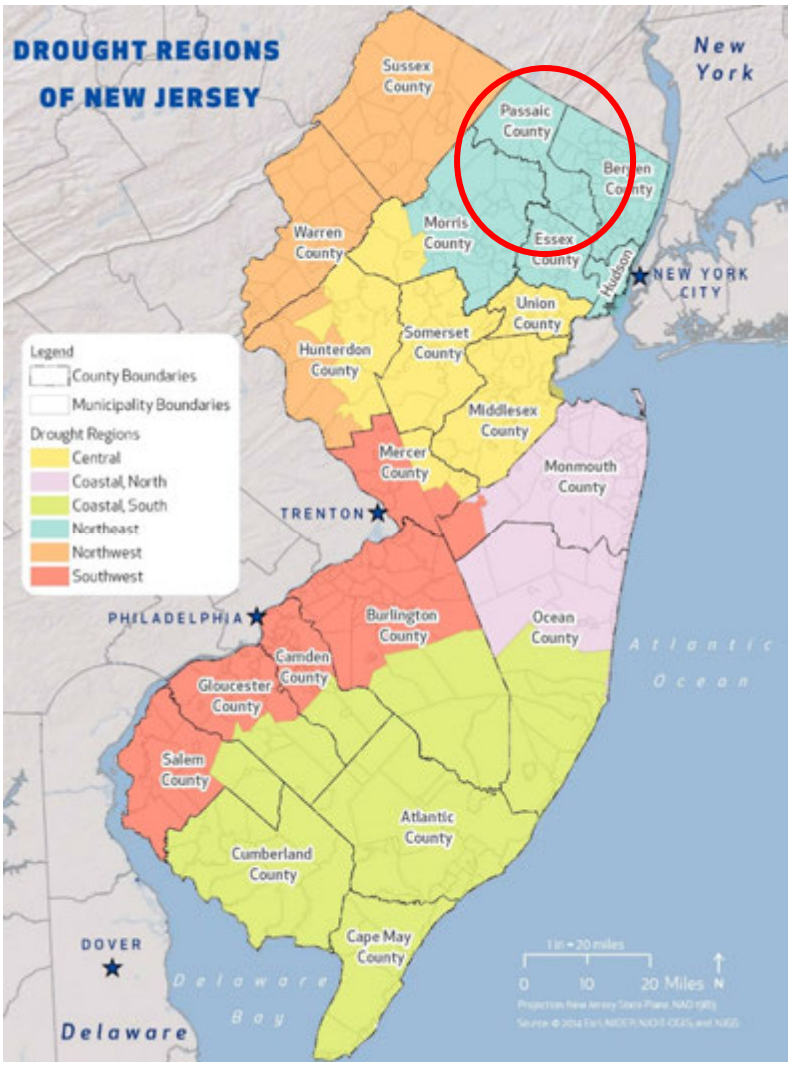
Drought is a period characterized by long durations of below normal precipitation. Drought conditions occur in virtually all climatic zones, yet characteristics of drought vary significantly from one region to another, relative to normal precipitation within respective regions. Drought can affect agriculture, water supply, aquatic ecology, wildlife, and plant life. Drought is a temporary irregularity in typical weather patterns and differs from aridity, which reflects low rainfall within a specific region and is a permanent feature of the climate of that area.

Location

Climate divisions are regions within a state that are climatically homogenous. The National Oceanic and Atmospheric Administration (NOAA) has divided the U.S. into 359 climate divisions. The boundaries of these divisions typically coincide with the county boundaries, except in the western U.S., where they are based largely on drainage basins (U.S. Energy Information Administration, Date Unknown). According to NOAA, New Jersey is made up of three climate divisions: Northern, Southern, and Coastal (NOAA 2020). Passaic County is located in the Northern Climate Division.

Drought regions allow New Jersey to respond to changing conditions without imposing restrictions on areas not experiencing water supply shortages. These regions were developed based upon hydro-geologic conditions, watershed boundaries, municipal boundaries, and water supply characteristics. Drought region boundaries are contiguous with municipal boundaries because during a water emergency, the primary enforcement mechanism for restrictions is municipal police forces. New Jersey is divided into six drought regions that are based on regional similarities in water supply sources and rainfall patterns. Passaic County is located in the Northeast Drought Region. According to the NJDEP, water supply sources available to this region include rivers and New Jersey reservoirs, both major supply sources, and unconfined groundwater (minor supply source) (NJDEP 2020; NJGIN 2020). Figure 4.3.4-1 shows the drought regions of New Jersey with Passaic County circled in red.

Figure 4.3.4-1. Drought Regions of New Jersey



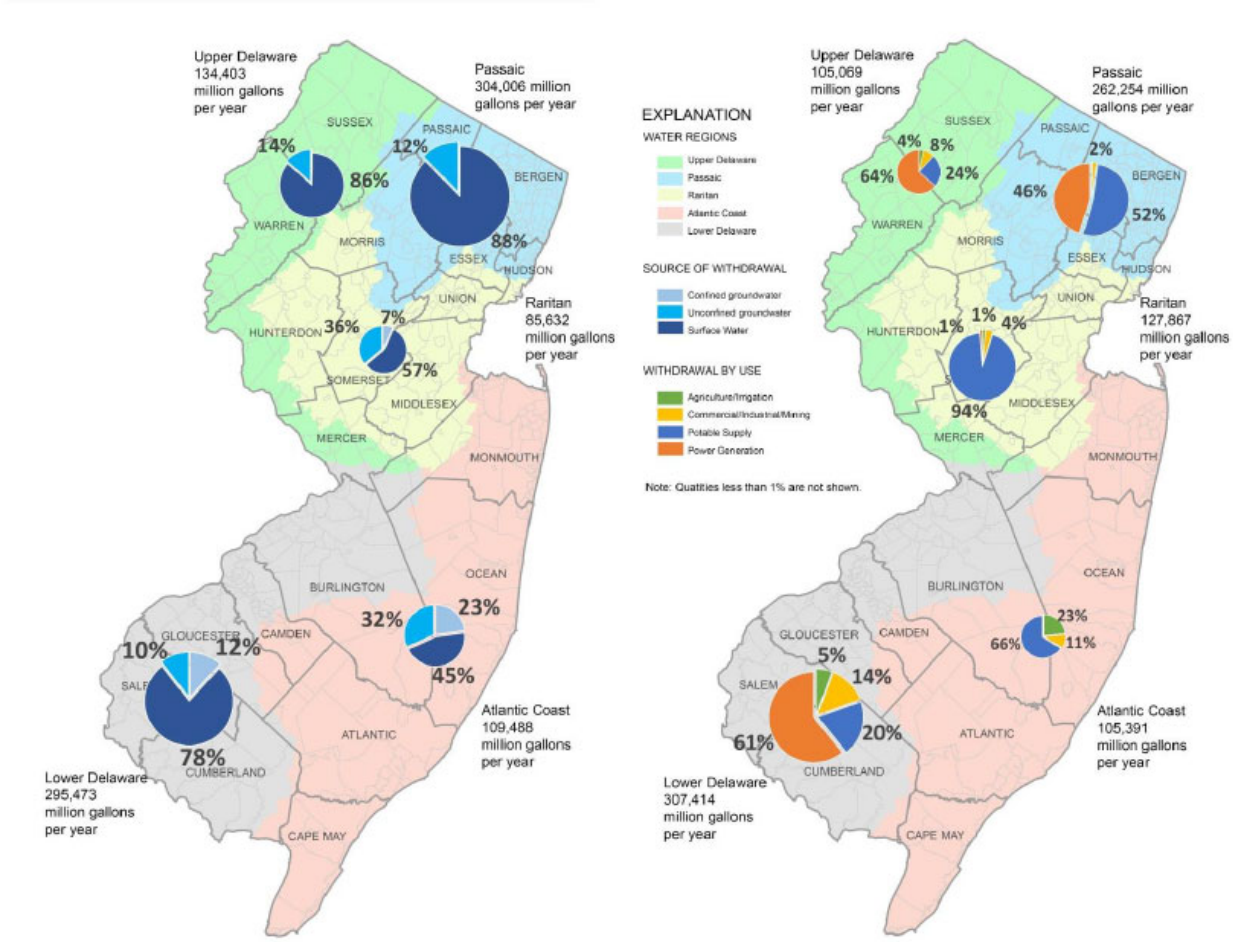
Source: *NJOEM (State HMP) 2019*

Note: *The red circle indicates the location of Passaic County*

As described in Section 3 (County Profile), Passaic County is located in the Highlands which serves as a vital source of drinking water for over half of New Jersey residents. The upper section of Passaic River and its tributaries (Pequannock, Rockaway, Wanaque, Ramapo, and Pompton Rivers) are a source of drinking water for millions of northern New Jersey residents. Interconnected systems deliver water through the New Jersey District Water Supply Commission, serving 107 municipalities; the Passaic Valley Water Commission serving the Cities of Clifton, Paterson, and Passaic and numerous surrounding municipalities; and the New Jersey American Water Company which serves 42 municipalities (Passaic River Institute of Montclair State University 2014).

There are five water regions across the State (compiled from HUCH11 Watershed Management Areas). Passaic County is located in the Passaic and Raritan water regions; refer to Figure 4.3.4-2. In terms of annual water withdrawal by sector, the majority is for potable water supply, followed by power generation, then commercial/industrial/mining. Water use trends, like withdrawal trends, vary from month to month with water use typically peaking during summer months when outdoor and irrigation demands are high (NJDEP 2013).

Figure 4.3.4-2. Water Regions, Sources and Withdrawal by Sector in New Jersey



Source: NJDEP 2017

Extent

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts (NOAA n.d., NDMC n.d.). The State of New Jersey uses a multi-index system that takes advantage of some of these indices to determine the severity of a drought or extended period of dry conditions.

Palmer Drought Severity Index

The Palmer Drought Severity Index is commonly used by drought monitoring agencies for drought reporting. The PDSI is primarily based on soil conditions. Soil with decreased moisture content is the first indicator of an overall moisture deficit. Table 4.3.4-1 lists the PDSI classifications. At the one end of the spectrum, 0 is used as normal and drought is indicated by negative numbers. For example, -2 is moderate drought, -3 is severe drought, and -4 is extreme drought. The PDSI also reflects excess precipitation using positive numbers; however, this is not shown in Table 4.3.4-1 (National Drought Mitigation Center [NDMC] 2013).

Table 4.3.4-1. Palmer Drought Category Descriptions

Category	Description	Possible Impacts	Palmer Drought Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting and growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.99
D1	Moderate drought	Some damage to crops and pastures; fire risk high; streams, reservoirs, or wells low; some water shortages developing or imminent; voluntary water-use restrictions requested.	-2.0 to -2.99
D2	Severe drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.99
D3	Extreme drought	Major crop or pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.99
D4	Exceptional drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

Source: NDMC 2020

Watches, Warnings and Emergencies

The Division of Water Supply and Geoscience within the NJDEP, regularly monitors various water supply conditions within the state based on the different Water Supply Regions. The water supply conditions aid the Department in declaring the regions as being within one of the four stages of water supply drought, Normal, Drought Watch, Drought Warning, and Drought Emergency.

- A ***Drought Watch*** is an administrative designation made by the Department when drought or other factors begin to adversely affect water supply conditions. A Watch indicates that conditions are dry but not yet significantly so. During a drought Watch, the Department closely monitors drought indicators (including precipitation, stream flows and reservoir and ground water levels, and water demands) and consults with affected water suppliers.
- A ***Drought Warning*** represents a non-emergency phase of managing available water supplies during the developing stages of drought and falls between the Watch and Emergency levels of drought response. The aim of a Drought Watch is to avert a more serious water shortage that would necessitate declaration of a water emergency and the imposition of mandatory water use restrictions, bans on water use, or other potentially drastic measures.
- A ***Drought Emergency*** can only be declared by the governor. While drought warning actions focus on increasing or shifting the supply of water, efforts initiated under a water emergency focus on reducing water demands. During a water emergency, a phased approach to restricting water consumption is typically initiated. Phase I water use restrictions typically target non-essential, outdoor water use (NJDEP Division of Water Supply and Geoscience 2018).

Previous Occurrences and Losses

Precipitation variability, coupled with concentrated population centers, can produce wide fluctuations in water availability and demands. The State and County have experienced several episodes of drought that have resulted in water shortages of varying degrees (e.g., mid-1960's, early to mid-1980's and 2001-2002) (NJDEP 2017).

Between 1954 and 2019, the State of New Jersey experienced two FEMA declared drought-related disasters (DR) or emergencies (EM) classified as a water shortage. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Of those two declarations, Passaic County has been included in both declarations (FEMA 2020).

Table 4.3.4-2. FEMA DR and EM Declarations for Drought Events in Passaic County, 1954 to 2019

FEMA Declaration Number	Date(s) of Event	Event Type
EM-3083	October 19, 1980	Water Shortage
DR-205	August 18, 1965	Water Shortage

Source: FEMA 2020

Agriculture-related drought disasters are quite common. One-half to two-thirds of the counties in the U.S. have been designated as disaster areas in each of the past several years. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2010 and 2019, New Jersey has been included in four USDA declarations as summarized in Table 4.3.4-3 (USDA 2020).

Table 4.3.4-2. USDA Disaster Declarations for Passaic County 2012-2019

Declaration	Event Date	Declaration Date	Event Description
S3930	April 1, 2015 – September 29, 2015	November 4, 2015	Excessive Heat and Drought
S3759	August 15, 2014 – Continuing	October 1, 2014	Drought
S3427	June 2, 2012 - Continuing	October 24, 2012	Drought and Heat, Excessive Heat, High Temp. (incl. low Humidity)
S3487	June 28, 2012 – November 8, 2012	February 14, 2013	Drought

Source: USDA 2020

Probability of Future Occurrences

Based upon risk factors for and past occurrences, it is likely that droughts will occur across New Jersey and Passaic County in the future. In addition, as temperatures increase (see climate change impacts), the probability for future droughts will likely increase as well. Therefore, it is likely that droughts will occur in New Jersey of varied severity in the future.

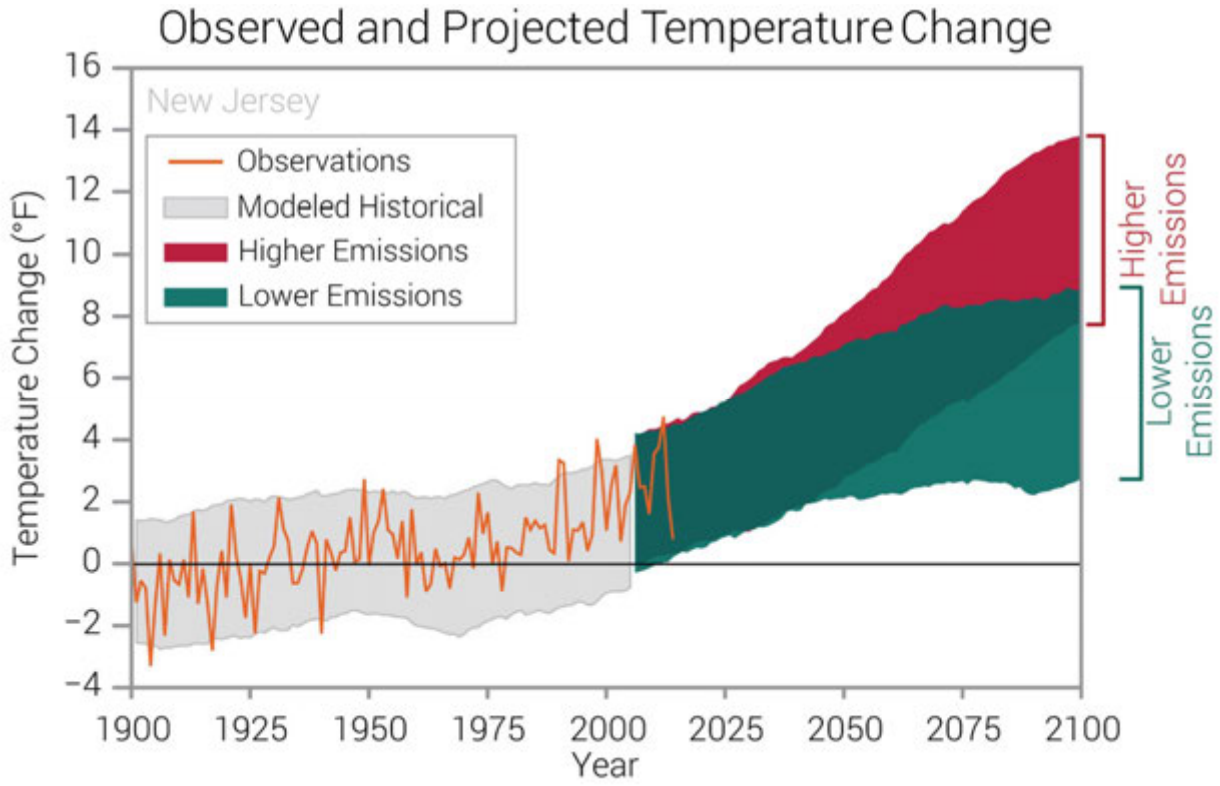
It is estimated that Passaic County will continue to experience direct and indirect impacts of drought and its impacts on occasion, with the secondary effects causing potential disruption or damage to agricultural activities and creating shortages in water supply within communities.

In Section 4.4 (Hazard Ranking), the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for drought in the County is considered 'frequent' .

Climate Change Impacts

The climate of New Jersey is already changing and will continue to change over the course of this century. Since 1900, temperatures in New Jersey have increased an average of 3 degrees Fahrenheit (°F). Historically unprecedented warming is projected by the end of the 21st century. Heat waves are projected to be more intense while cold waves are projected to be less intense (Office of the New Jersey State Climatologist [ONJSC] 2020). New Jersey has consistently been above the 1900-2014 mean during the 21st century with the highest 5-year average number occurring during 2010-2014 (NOAA NCICS 2020). Figure 4.3.4-3 depicts the observed and projected temperature change for New Jersey from 1900 to 2100.

Figure 4.3.4-3. Observed and Projected Temperature Change in New Jersey



Source: NOAA NCICS 2020

Either under a high or lower emissions pathway, historically unprecedented warming is projected by the end of the 21st century. Increases in the number of extremely hot days and decreases in the number of extremely cold days are projected to accompany the overall warming. According to state-level analysis, by the middle of the 21st century an estimated 70% of summers in this northeast region are anticipated to be hotter than what we now recognize as the warmest summer on record. (NOAA NCICS 2020) These trends will certainly affect the probability and frequency of dry conditions that could lead to drought events in Passaic County.

4.3.4.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. The following discusses Passaic County's vulnerability, in a qualitative nature, to the drought hazard.

Impact on Life, Health and Safety

The entire population of Passaic County is exposed to drought events (population of 510,562 people, according to the 2013-2017 American Community Survey population estimates). Drought conditions can cause a shortage of potable water for human consumption, both in quantity and quality. A decrease in available water may also impact power generation and availability to residents.

Public health impacts may include an increase in heat-related illnesses, waterborne illnesses, recreational risks, limited food availability, and reduced living conditions. Vulnerable populations could be particularly susceptible to the drought hazard and cascading impacts due to age, health conditions, and limited ability to mobilize to shelter, cooling and medical resources. Other possible impacts to health due to drought include increased recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and sanitation and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Health implications of drought are numerous. Some drought-related health effects are short-term while others can be long-term (CDC 2020).

Surface water supplies are affected more quickly during droughts than groundwater sources; however, groundwater supplies generally take longer to recover. In addition to 145 suppliers of groundwater throughout Passaic County, the following list provides the surface water suppliers for Passaic County (NJ Drinking Water Watch 2019):

- Bloomingdale Water Company
- NJ American Water Resources – Little Falls
- Passaic Valley Water Commission
- Ringwood Water Department
- Totowa Water Department
- Wayne Township Division of Water and Sewer
- N.J.D.W.S.C. – Wanaque North
- Passaic Valley W C High Crest
- Woodland Park Water Department

As previously stated, drought conditions can cause shortages in water for human consumption. Droughts can also lead to reduced local firefighting capabilities. The drought hazard is a concern for Passaic County because the County's water is supplied by both surface water and groundwater. In the short-term, surface water supplies are affected more quickly during droughts than groundwater sources.

The Centers for Disease Control and Prevention's (CDC) 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. Passaic County's overall score is 0.7768, indicating that its communities have high social vulnerability and impacts from a drought event may be exacerbated (CDC 2016).

Impact on General Building Stock

No structures are anticipated to be directly affected by a drought event. However, droughts contribute to conditions conducive to wildfires and reduce fire-fighting capabilities. Risk to life and property is greatest in those areas where forested areas adjoin urbanized areas (high density residential, commercial and industrial) also known as the wildfire urban interface (WUI). Therefore, all assets in and adjacent to, the WUI zone, including population, structures, critical facilities, lifelines, and businesses are considered vulnerable to wildfire. Refer Section 4.3.13 for the Wildfire risk assessment.

Impact on Critical Facilities

As mentioned, drought events generally do not impact buildings; however, droughts have the potential to impact agriculture-related facilities and critical facilities that are associated with water supplies such as potable water used with fire-fighting services. Critical facilities in and adjacent to the wildfire hazard areas are considered vulnerable to wildfire.

Water systems and thus distribution to the population may also be impacted by other hazards such as extreme weather events. A good example is Superstorm Sandy where storm surge damaged critical water supply infrastructure along the coast and high winds impacted energy distribution across the State which in turn impacted the ability to supply water. As a result, NJDEP has developed new guidance aimed to ensure that repairs, reconstruction, new facilities and operations/maintenance are focused on enhancing the resilience of critical infrastructure (NJDEP 2017).

Impact on the Economy

Drought can produce a range of impacts that span many economic sectors and can reach beyond an area experiencing physical drought. As previously discussed, water withdrawals are not only used for potable water but for use in the commercial/industrial/mining sectors and power generation. When a state of water emergency is declared by the Governor (when a potential or actual water shortage endangers the public health, safety and welfare), the NJDEP may impose mandatory water restrictions and require specific actions to be taken by water suppliers. According to the New Jersey Water Supply Plan, a water emergency seeks to cause as little disruption as possible to commercial activity and employment (NJDEP 2017).

A prolonged drought can have a serious economic impact on a community. One impact of drought is its impact on water supply. When drought conditions persist with little to no relief, water restrictions may be put into place by local or state governments. These restrictions may include placing limitations on when or how frequent lawns can be watered, car washing services, or any other recreational/commercial outdoor use of water supplies. In exceptional drought conditions, watering of lawns and crops may not be an option. If crops are not able to receive water, farmland will dry out and crops will die. This can lead to crop shortages, which, in turn, increases the price of food (North Carolina State University 2013).

Increased demand for water and electricity can also result in shortages and higher costs for these resources. Industries that rely on water for business could be impacted the most (e.g., landscaping businesses). Although most businesses will still be operational, they may be impacted aesthetically. These aesthetic impacts are most significant within the recreation and tourism industry. Moreover, droughts within another area could impact the food supply and price of food for residents within the county.

Direct impacts of drought include reduced crop yield, increased fire hazard, reduced water levels, and damage to wildlife and fish habitat. The many impacts of drought can be listed as economic, environmental, or social. Direct and indirect losses include the following:

- Damage to crop quality and crop losses.
- Insect infestation leading to crop and tree losses.
- Plant diseases leading to loss of agricultural crops and trees.
- Reduction in outdoor activities.
- Increased risk of brush fires and wildfires due to dried crops, grasses, and dying trees.

When a drought occurs, the agricultural industry is most at risk in terms of economic impact and damage. For example, crops may not mature leading to a lessened crop yield, wildlife and livestock may become undernourished, land values could decrease, and ultimately there could be a financial loss for the farmer (FEMA,

1997). Based on the 2017 Census of Agriculture, there were 89 farms in Passaic County, a 14% increase from the 2012 reports. The average farm size was 12 acres. Passaic County farms had a total market value of products sold of $2.7 million in crop sales and $143,000 in livestock sales. Table 4.3.4-6 summarizes the acreage of agricultural land exposed to the drought hazard.

Table 4.3.4-6. Agricultural Land in Passaic County in 2017

Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Harvested Cropland (acres)	Irrigated Land (acres)
89	1,893	308	270	101

Source: USDA 2017

(D) Withheld to avoid disclosing data for individual farms

Impact on the Environment

Droughts can impact the environment because these events can trigger wildfires, increase insect infestations, and exacerbate the spread of disease (NOAA 2020). Droughts will also impact water resources that are relied upon by aquatic and terrestrial species. Ecologically sensitive areas, such as wetlands, can be particularly vulnerable to drought periods because they are dependent on steady water levels and soil moisture availability to sustain growth. As a result, these types of habitats can be negatively impacted after long periods of dryness (NJDEP 2017).

Droughts also have the potential to lead to water pollution due to the lack of rainwater to dilute any chemicals in water sources. Contaminated water supplies may be harmful to plans and animals. If water is not getting into the soils, the ground will dry up and become unstable. Unstable soils increase the risk of erosion and loss of topsoil (North Carolina State University 2013).

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

As discussed in Section 3 (County Profile), areas targeted for future growth and development have been identified across Passaic County. The New Jersey Water Supply Plan indicates seasonal outdoor water use is rising and is attributable to continued suburbanization and increases in residential and commercial lawn and landscape maintenance. Changes in water demands by commercial/industrial users will depend on future development of this water type use and how effectively efficiency techniques are implemented (NJDEP 2017).

Projected Changes in Population

Potable water use is the second largest water use sector and largest consumptive use in New Jersey. As such, population projections, per capital water use and percent non-residential water use by water system are important factors to consider when assessing future water needs. Passaic County has experienced population growth since 2010. The Boroughs of Bloomingdale, Wanaque and Woodland Park have experienced the greatest percentage of growth since 2010; greater than 5% each. Increases in population may create greater strain on water resources in those communities, throughout Passaic County and the region as a whole.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures. Additionally, the State is projected to experience more frequency droughts which may affect the availability of water supplies, primarily placing an increased stress on the population and their available potable water. Agricultural needs may increase if the climate grows warmer but may decrease if more efficient irrigation techniques are adopted broadly or if precipitation increases. A decrease in water supply, or increase in water supply demand, may increase the County's vulnerability to structural fire and wildfire events. Critical water-related service sectors may need to adjust management practices and actively manage resources to accommodate for future changes.

Vulnerability Change Since the 2015 HMP

When examining the change in the County's vulnerability to drought events from the 2015 HMP to this update, it is important to look at each entity that is exposed and vulnerable. The total population across the County has experienced a slight increase, which can place a greater stress on the water supply during a drought event. In terms of the agricultural industry for Passaic County, there has been a 14% increase in the number of farms since the 2012 USDA report.

4.3.5 Earthquake

The following section provides the hazard profile and vulnerability assessment for the earthquake hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2015 and 2019.
- The New Jersey Geologic and Water Survey (NJGWS) updated liquefaction data was included in the vulnerability assessment.
- Updated HAZUS-MH probabilistic modeling using v4.2 was conducted using updated inventory data.
- Impacts on the environment are summarized in the vulnerability assessment.

4.3.5.1 Profile

Hazard Description

An earthquake is the sudden movement of the Earth's surface caused by the release of stress accumulated within or along the edge of the Earth's tectonic plates, a volcanic eruption, or by a manmade explosion (Federal Emergency Management Agency [FEMA] 2001; Shedlock and Pakiser 1997). Most earthquakes occur at the boundaries where the Earth's tectonic plates meet (faults); less than 10% of earthquakes occur within plate interiors. New Jersey is in an area where the rarer plate interior-related earthquakes occur. As plates continue to move and plate boundaries change geologically over time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust (Shedlock and Pakiser 1997).

The location of an earthquake is commonly described by its focal depth and the geographic position of its epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates, also called the focus or hypocenter. The epicenter of an earthquake is the point on the Earth's surface directly above the hypocenter (Shedlock and Pakiser 1997). Earthquakes usually occur without warning and their effects can impact areas of great distance from the epicenter (FEMA 2001).

According to the U.S. Geological Survey (USGS) Earthquake Hazards Program, an earthquake hazard is any disruption associated with an earthquake that may affect residents' normal activities. This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches; each of these terms is defined below; however, not all occur within the Passaic County planning area:

- *Surface faulting*: Displacement that reaches the earth's surface during a slip along a fault. Commonly occurs with shallow earthquakes—those with an epicenter less than 20 kilometers.
- *Ground motion (shaking):* The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by a sudden slip on a fault or sudden pressure at the explosive source and travel through the Earth and along its surface.
- *Landslide*: A movement of surface material down a slope.
- *Liquefaction*: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like the wet sand near the water at the beach. Earthquake shaking can cause this effect.
- *Tectonic Deformation*: A change in the original shape of a material caused by stress and strain.
- *Tsunami*: A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major sub-marine slides, or exploding volcanic islands.

- *Seiche*: The sloshing of a closed body of water, such as a lake or bay, from earthquake shaking (USGS 2012a).

Earthquakes can cause large and sometimes disastrous landslides and mudslides. Any steep slope is vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes. Landslides are further discussed in Section 4.5.7 (Geologic Hazards) of this HMP update.

Earthquakes can also cause dam failures. The most common mode of earthquake-induced dam failure is slumping or settlement of earth-fill dams where the fill has not been property compacted. If the slumping occurs when the dam is full, then overtopping of the dam, with rapid erosion leading to dam failure is possible. Dam failure is also possible if strong ground motions heavily damage concrete dams. Earthquake-induced landslides into reservoirs have also caused dam failures.

Another secondary effect of earthquakes that is often observed in low-lying areas near water bodies is ground liquefaction. Liquefaction is the conversion of water-saturated soil into a fluid-like mass. This can occur when loosely packed, waterlogged sediments lose their strength in response to strong shaking. Liquefaction effects may occur along the shorelines of the ocean, rivers, and lakes and they can also happen in low-lying areas away from water bodies in locations where the ground water is near the earth's surface.

Tsunamis are formed as a result of earthquakes, volcanic eruptions, or landslides that occur under the ocean. When these events occur, huge amounts of energy are released as a result of quick, upward bottom movement. A wave is formed when huge volumes of ocean water are pushed upward. A large earthquake can lift large portions of the seafloor, which will cause the formation of huge waves (U.S. Search and Rescue Task Force Date Unknown).

Location

Earthquakes are most likely to occur in the northern parts of New Jersey, which includes Passaic County, where significant faults are concentrated; however, low-magnitude events can and do occur in many other areas of the State. The National Earthquake Hazard Reduction Program (NEHRP) developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, as noted in Table 4.3.5-1, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses.

Table 4.3.5-1. NEHRP Soil Classifications

Soil Classification	Description
A	Hard Rock
B	Rock
C	Very dense soil and soft rock
D	Stiff soils
E	Soft soils

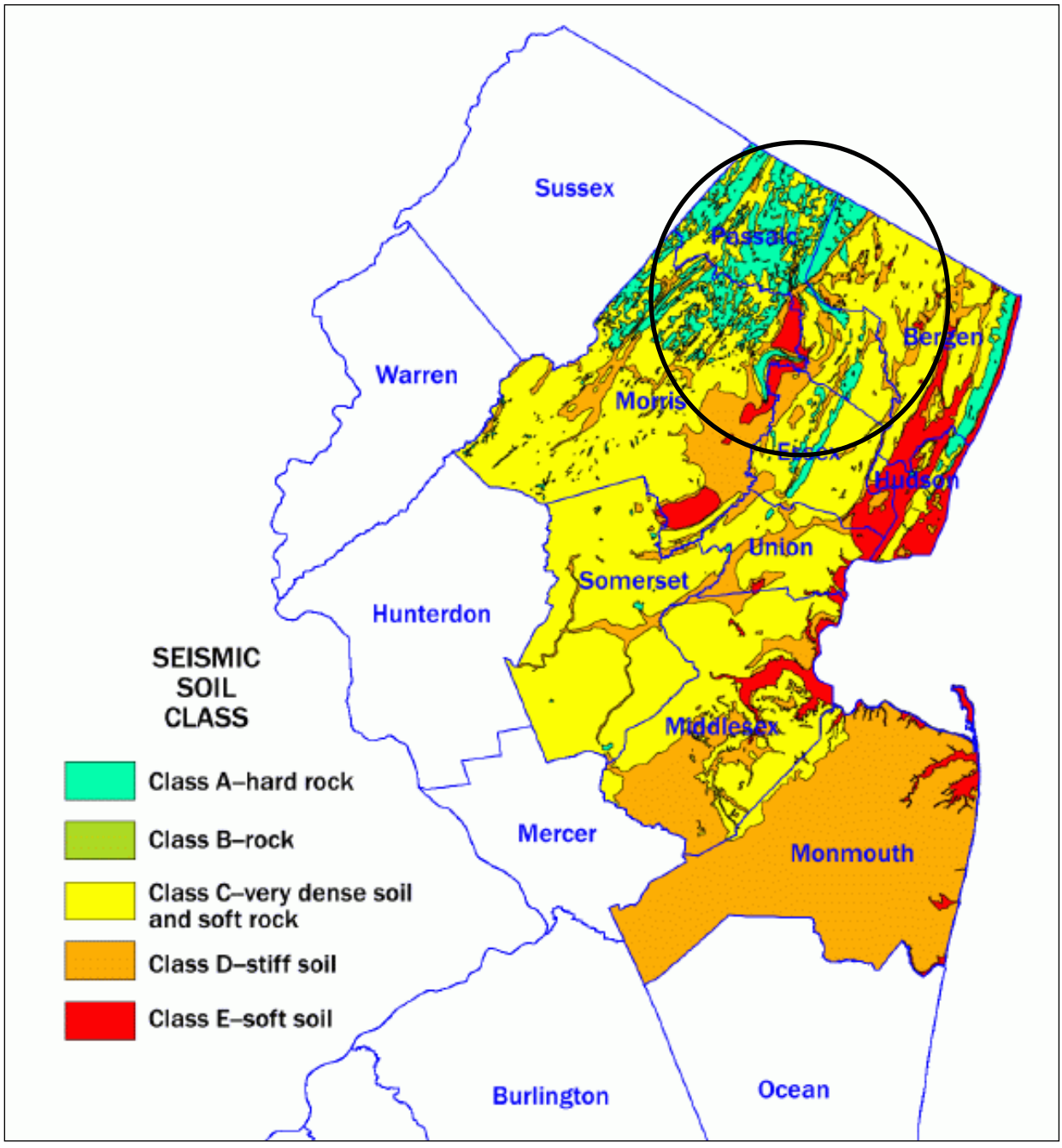
Source: FEMA 2013

NEHRP National Earthquake Hazard Reduction Program

Figure 4.3.5-1 illustrates the NEHRP soils located in the northeast quadrant of the State. The available NEHRP soils information is incorporated into the HAZUS-MH earthquake model for the risk assessment (discussed in further detail later in this section). According to this figure, Passaic County is predominately underlain by Class

C soils, with bands of Class A in the central portion of the County and areas of Class D in the western and southwestern areas.

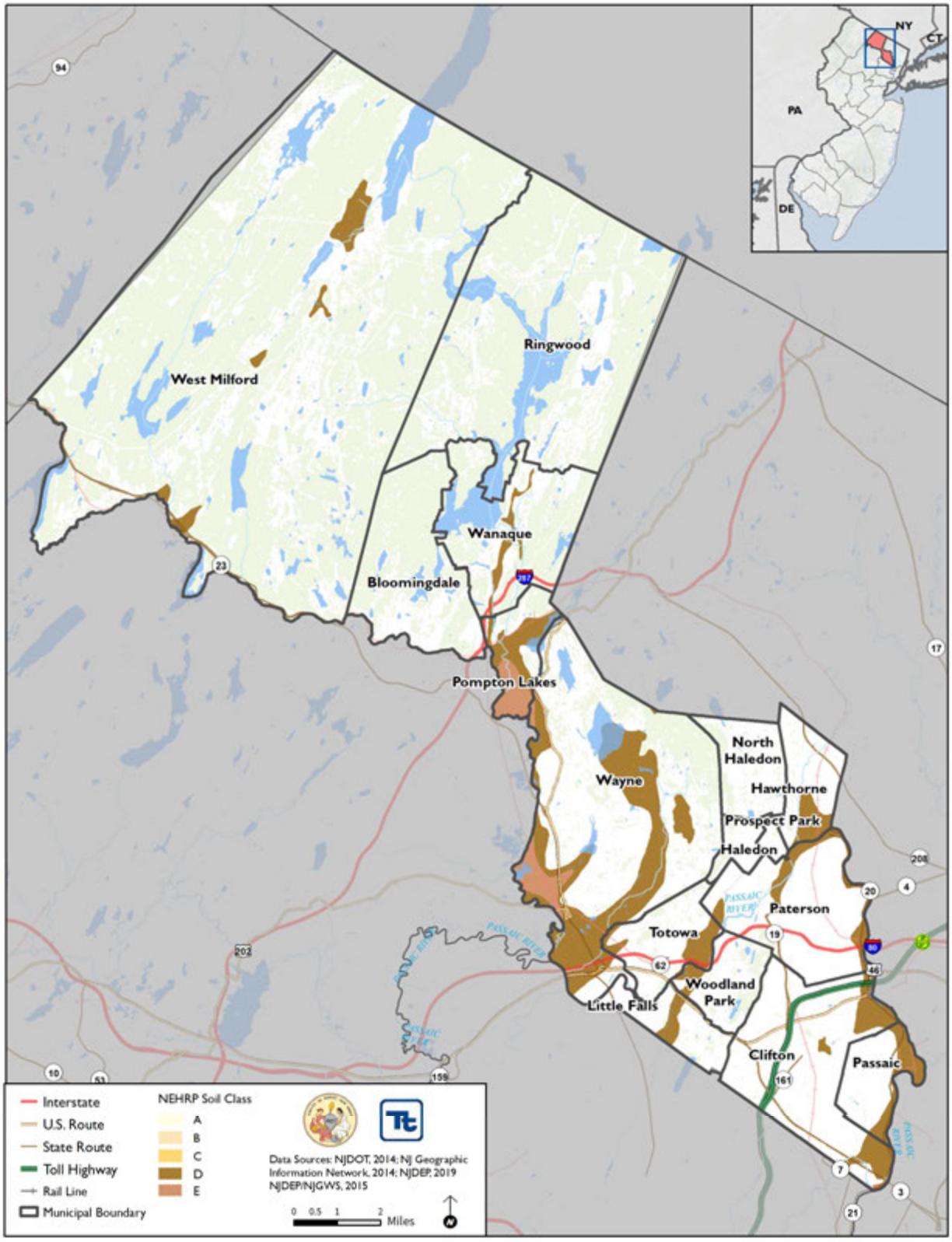
Figure 4.3.5-1. Seismic Soils in Northeastern New Jersey



Source: New Jersey Geological and Water Survey (NJGWS) and New Jersey Department of Environmental Protection (NJDEP) 2011

Note: The black circle indicates the location of Passaic County. The County contains mainly Class C soils, with areas of Class A, B, D, and E.

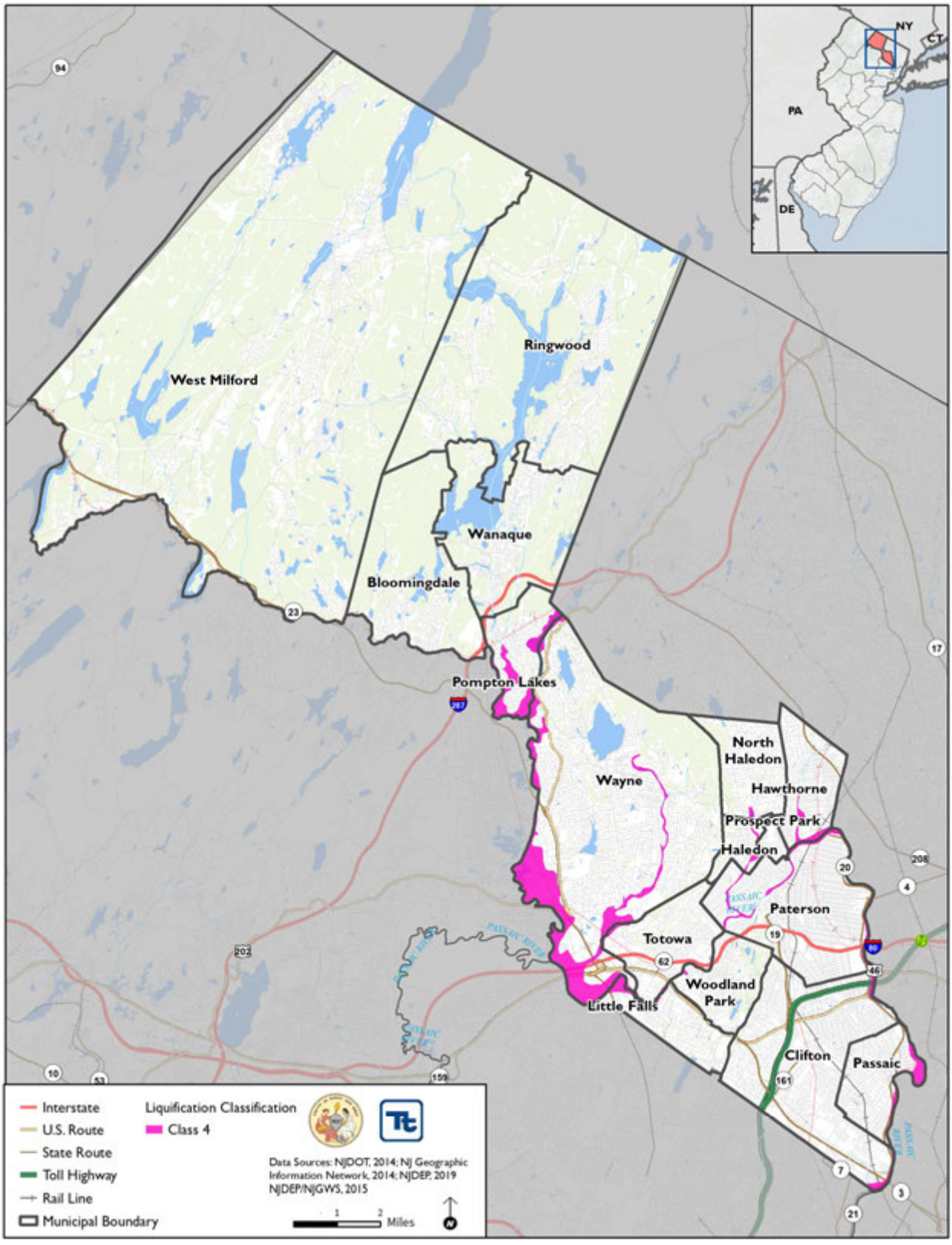
Figure 4.3.5-2. NEHRP Soils in Passaic County



Note: NEHRP National Earthquake Hazard Reduction Program

Liquefaction has been responsible for tremendous amounts of damage in historical earthquakes around the world. Shaking behavior and liquefaction susceptibility of soils are determined by their grain size, thickness, compaction, and degree of saturation. These properties, in turn, are determined by the geologic origin of the soils and their topographic position. In terms of liquefaction susceptibility, the interior of the northwestern and southeastern corners and some parts in central and western Passaic County have a medium susceptibility, and southeastern Passaic County and the western edge and northwest corner of the County along the Passaic River have a high liquefaction susceptibility (see Figure 4.3.5-3).

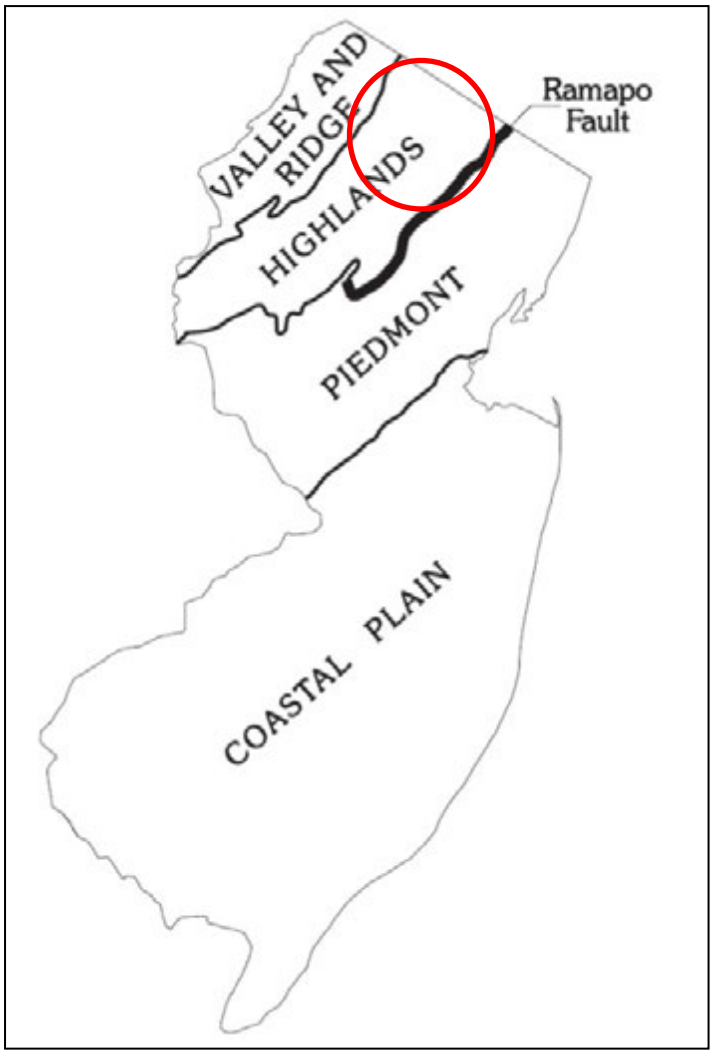
Figure 4.3.5-3. Liquefaction Susceptibility Class in Passaic County



Faults are observed and mapped at the surface. There is no known surface ground displacement along faults in the eastern U.S. from historic earthquakes. Earthquake epicenters in eastern North America and the New Jersey area, in general, do not now occur on known faults. The faults in these parts are from tectonic activity more than 200 million years ago (Muessig, 2013).

There are many faults in New Jersey; however, the Ramapo Fault, which separates the Piedmont and Highlands Physiographic Provinces, is best known. Numerous minor earthquakes have been recorded in the Ramapo Fault zone, a 10- to 20-mile-wide area lying adjacent to, and west, of the actual fault (Dombroski 1973 [revised 2005]). Figure 4.3.5-4 illustrates the relationship of the Ramapo fault line with the physiologic provinces of New Jersey. Passaic County is located in the Highlands and Piedmont Province and near the Ramapo Fault line.

Figure 4.3.5-4. Physiographic Provinces of New Jersey and the Ramapo Fault Line



Source: Dombroski 1973 (revised 2005)

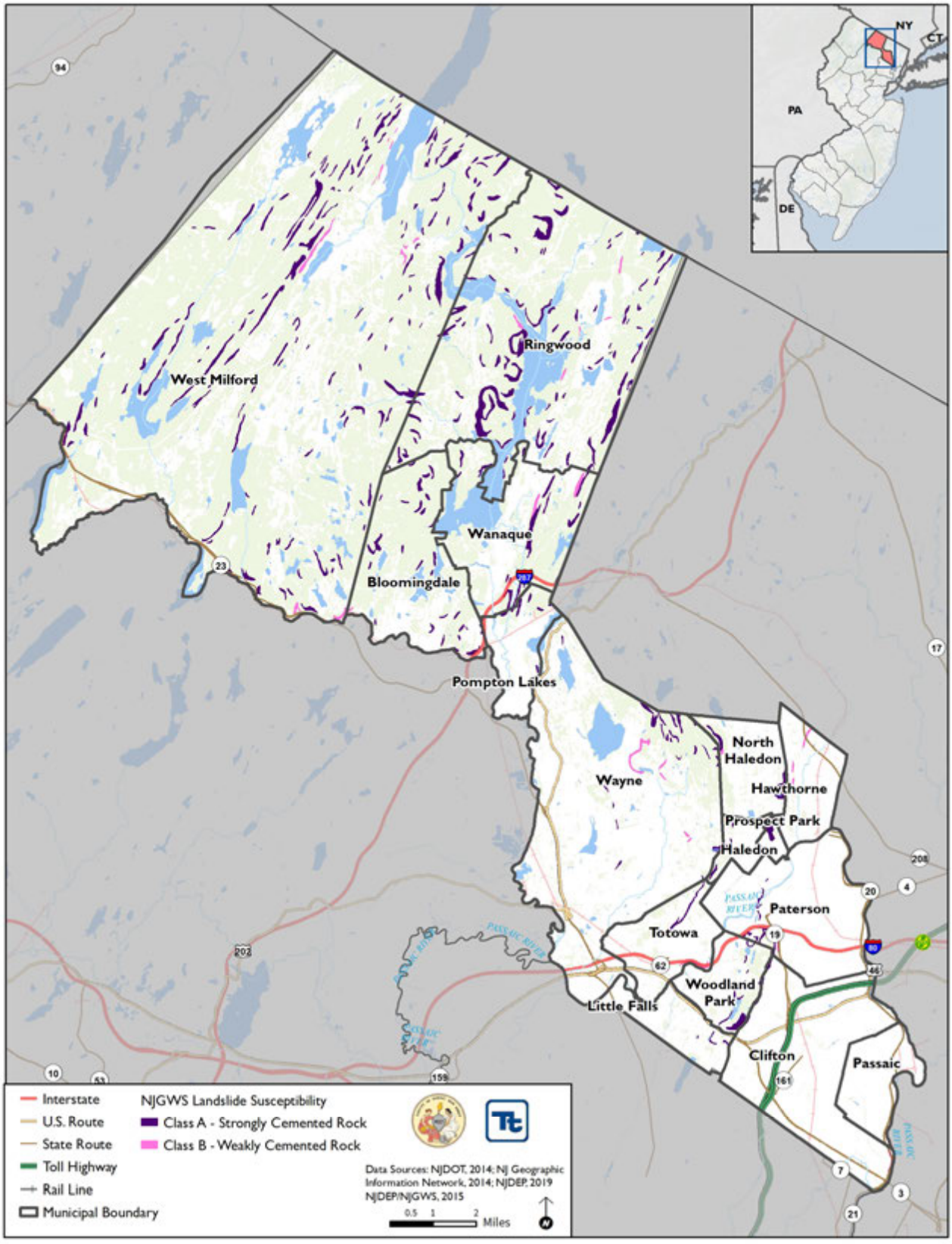
Note: The red circle indicates the approximate location of Passaic County. The County is part of Piedmont Province.

Landslides include a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. However, gravity acting on a steep slope is the primary reason for all landslides. For detailed information regarding landslides and other geological hazards, see Section 4.3.8 (Geological Hazards). Other contributing factors include:

- Erosion by rivers, glaciers, or ocean waves that create oversteepened slopes
- Rock and soil slopes weakened through saturation by snowmelt or heavy rain
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or from man-made structures that may stress weak slopes to failure and other structures

Earthquakes may contribute to landslide hazards. Earthquakes create stresses that make weak slopes fail. Earthquakes of magnitude 4.0 or greater have been known to trigger landslides. The susceptibility of slopes to landsliding during earthquakes is illustrated in Figure 4.3.5-5. This data indicates that a majority of northern Passaic County is classified as Class AI, strongly cemented rock, slope angle 15 to 20 degrees. The Boroughs of Ringwood and Wanaque are classified as Class AII, strongly cemented rock, slope, angle 30-40 degrees. A majority of southern Passaic County is not classified. Northeastern Wayne Township is classified as Class AII. Small portions of Prospect Park, Hawthorne, Paterson and Clifton are classified as Class AVI, strongly cemented rock, slope angle >40 degrees.

Figure 4.3.5-5. Susceptibility of Slopes to Landsliding During Earthquakes in Passaic County



Extent

An earthquake's magnitude and intensity are used to describe the size and severity of the event. Magnitude describes the size at the focal point of an earthquake, and intensity describes the overall severity of shaking felt during the event. The earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude was formerly expressed by ratings on the Richter scale but is now most commonly expressed using the moment magnitude (Mw) scale. This scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). The scale is as follows:

- Great Mw > 8
- Major Mw = 7.0 – 7.9
- Strong Mw = 6.0 – 6.9
- Moderate Mw = 5.0 – 5.9
- Light Mw = 4.0 – 4.9
- Minor Mw = 3.0 – 3.9
- Micro Mw = 3.0 – 3.9

The most commonly used intensity scale is the modified Mercalli intensity scale. Ratings of the scale, as well as the perceived shaking and damage potential for structures, are shown in Table 4.3.5-2. The modified Mercalli intensity scale is generally represented visually using shake maps, which show the expected ground shaking at any given location produced by an earthquake with a specified magnitude and epicenter An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at sites, and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A USGS shake map shows the variation of ground shaking in a region immediately following significant earthquakes. Table 4.3.5-3 displays the MMI scale and its relationship to the areas peak ground acceleration (PGA).

Table 4.3.5-2. Modified Mercalli Intensity Scale

Mercalli Intensity	Description
a	Felt by very few people; barely noticeable.
II	Felt by few people, especially on upper floors.
III	Noticeable indoors, especially on upper floors, but may not be recognized as an earthquake.
IV	Felt by many indoors, few outdoors. May feel like passing truck.
V	Felt by almost everyone, some people awakened. Small objects move; trees and poles may shake.
VI	Felt by everyone; people have trouble standing. Heavy furniture can move; plaster can fall off walls. Chimneys may be slightly damaged.
VII	People have difficulty standing. Drivers feel their cars shaking. Some furniture breaks. Loose bricks fall from buildings. Damage is slight to moderate in well-built buildings; considerable in poorly built buildings.
VIII	Well-built buildings suffer slight damage. Poorly built structures suffer severe damage. Some walls collapse.
IX	Considerable damage to specially built structures; buildings shift off their foundations. The ground cracks. Landslides may occur.
X	Most buildings and their foundations are destroyed. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. The ground cracks in large areas.
XI	Most buildings collapse. Some bridges are destroyed. Large cracks appear in the ground. Underground pipelines are destroyed.
XII	Almost everything is destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move.

Source: USGS 2016c

Table 4.3.5-3. Modified Mercalli Intensity and PGA Equivalents

Modified Mercalli Intensity	Acceleration (%g) (PGA)	Perceived Shaking	Potential Damage
I	< .17	Not Felt	None
II	.17 – 1.4	Weak	None
III	.17 – 1.4	Weak	None
IV	1.4 – 3.9	Light	None
V	3.9 – 9.2	Moderate	Very Light
VI	9.2 – 18	Strong	Light
VII	18 – 34	Very Strong	Moderate
VIII	34 – 65	Severe	Moderate to Heavy

Source: Freeman et al. 2004
Note: PGA Peak Ground Acceleration

The ground experiences acceleration as it shakes during an earthquake. The peak ground acceleration (PGA) is the largest acceleration recorded by a monitoring station during an earthquake. PGA is a measure of how hard the earth shakes in a given geographic area. It is expressed as a percentage of the acceleration due to gravity (%g). Horizontal and vertical PGA varies with soil or rock type. Earthquake hazard assessment involves estimating the annual probability that certain ground accelerations will be exceeded, and then summing the annual probabilities over a time period of interest. Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures, as noted in Table 4.3.5-4.

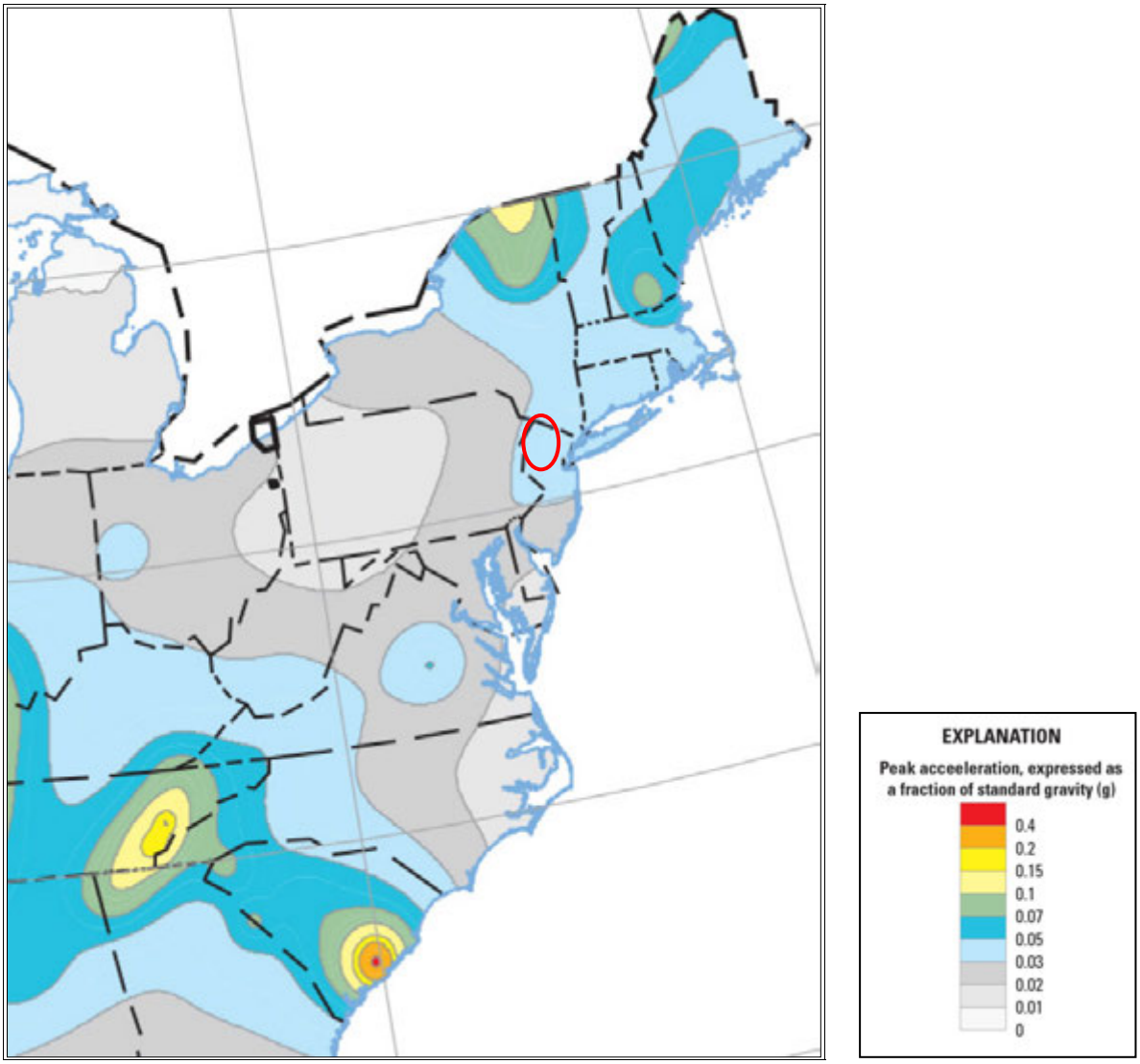
Table 4.3.5-4. Damage Levels Experienced in Earthquakes

Ground Motion Percentage	Explanation of Damages
1-2%g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10%g	Usually causes only slight damage, except in unusually vulnerable facilities.
10 - 20%g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20 - 50%g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50%g	May causes higher levels of damage in many buildings, even those designed to resist seismic forces.

Source: NJOEM 2011
Note: %g Peak Ground Acceleration

National maps of earthquake shaking hazards provide information for creating and updating seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land use planning. After thorough review of the studies, professional organizations of engineers update the seismic-risk maps and seismic design requirements contained in building codes. The USGS updated the National Seismic Hazard Maps in 2014 (Figure 4.3.5-6). New seismic, geologic, and geodetic information on earthquake rates and associated ground shaking were incorporated into these revised maps.

Figure 4.3.5-6. Peak Acceleration (%g) with 10% Probability of Exceedance in 50 Years (2014)



Source: Petersen, et. al. 2014
Notes:
%g Percent acceleration force of gravity
PGA Peak ground acceleration
The red circle indicates the approximate location of Passaic County. The figure indicates that the county has a PGA between 3 and 5%g.

A probabilistic assessment was conducted for the 100-, 500- and 2,500-year MRP in HAZUS-MH 2.1 to analyze the earthquake hazard for Passaic County. In summary, a 100-year mean return period (MRP) event is an earthquake with 1-percent chance that mapped ground motion levels (PGA) will be exceeded in any given year. A 500-year MRP is an earthquake with 0.2 percent chance that mapped PGAs will be exceeded in any given year. A 2,500-year MRP is an earthquake with 0.04 percent chance that mapped PGAs will be exceeded in any given year.

The HAZUS analysis evaluates the statistical likelihood that a specific event will occur and what consequences will occur. Figure 4.3.5-7 through Figure 4.3.5-9 illustrate the geographic distribution of PGA (%g) across the County or 100-, 500- and 2,500-year MRP events by Census-tract.

Figure 4.3.5-7. Peak Ground Acceleration 100-Year MRP for Passaic County

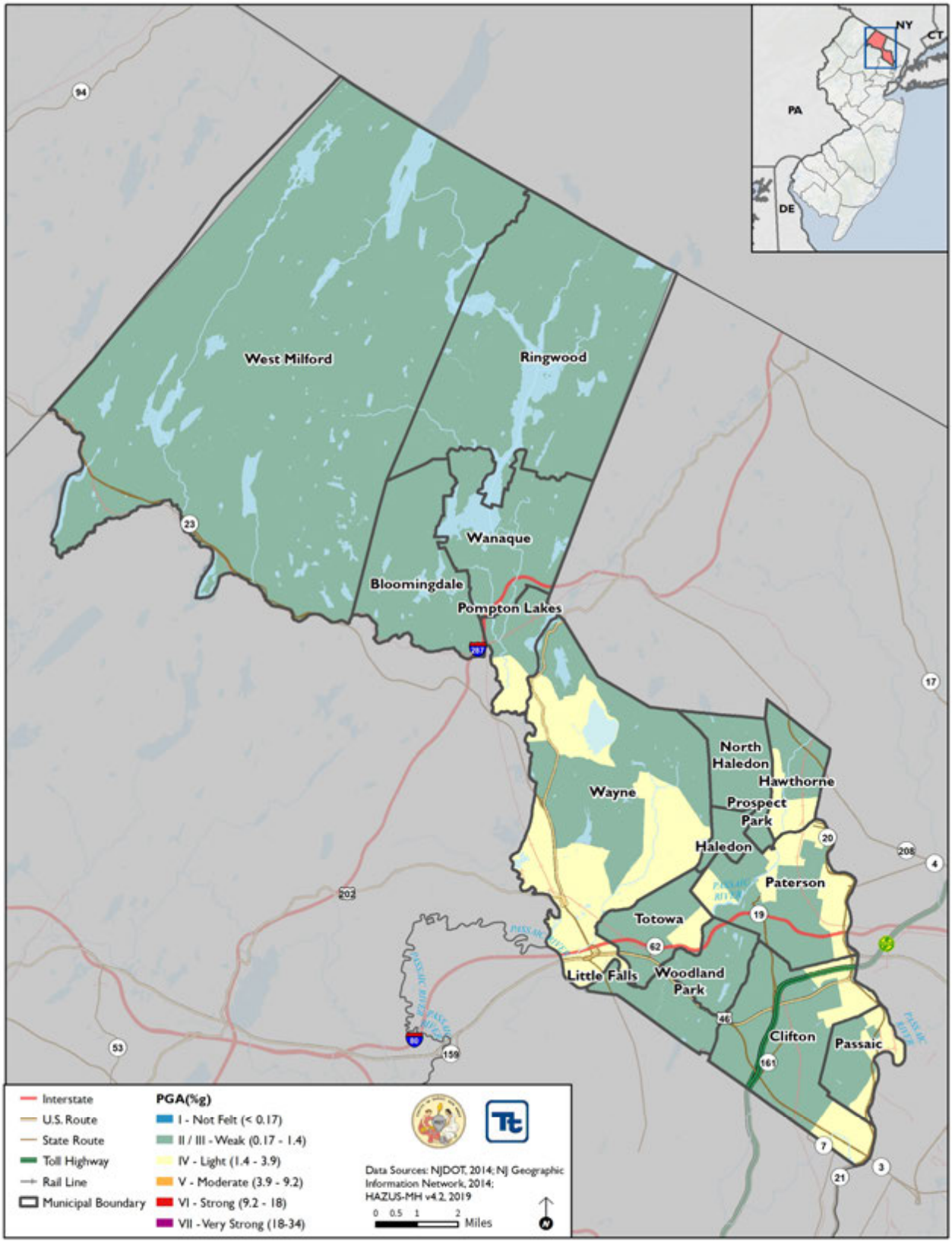


Figure 4.3.5-8. Peak Ground Acceleration 500-Year MRP for Passaic County

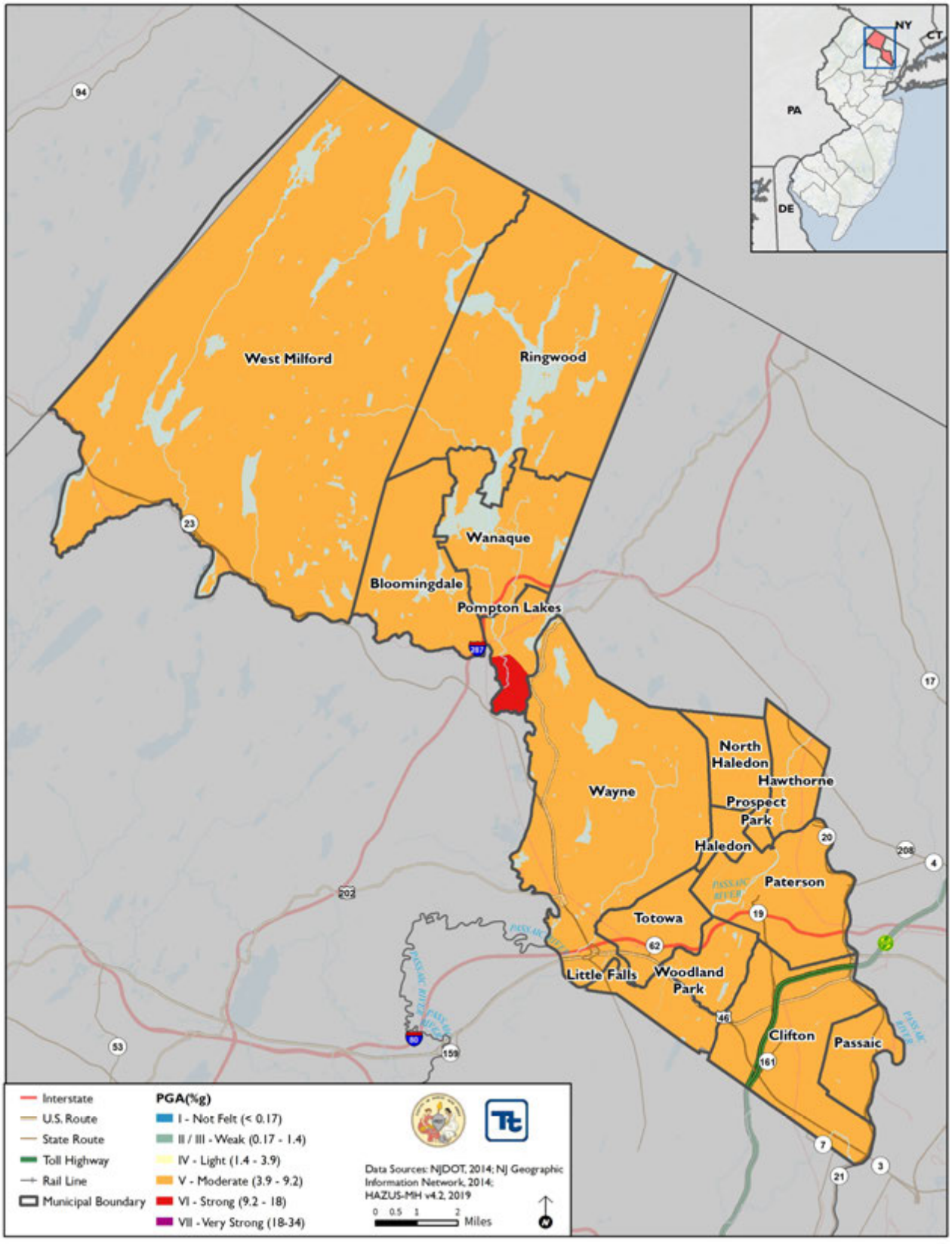
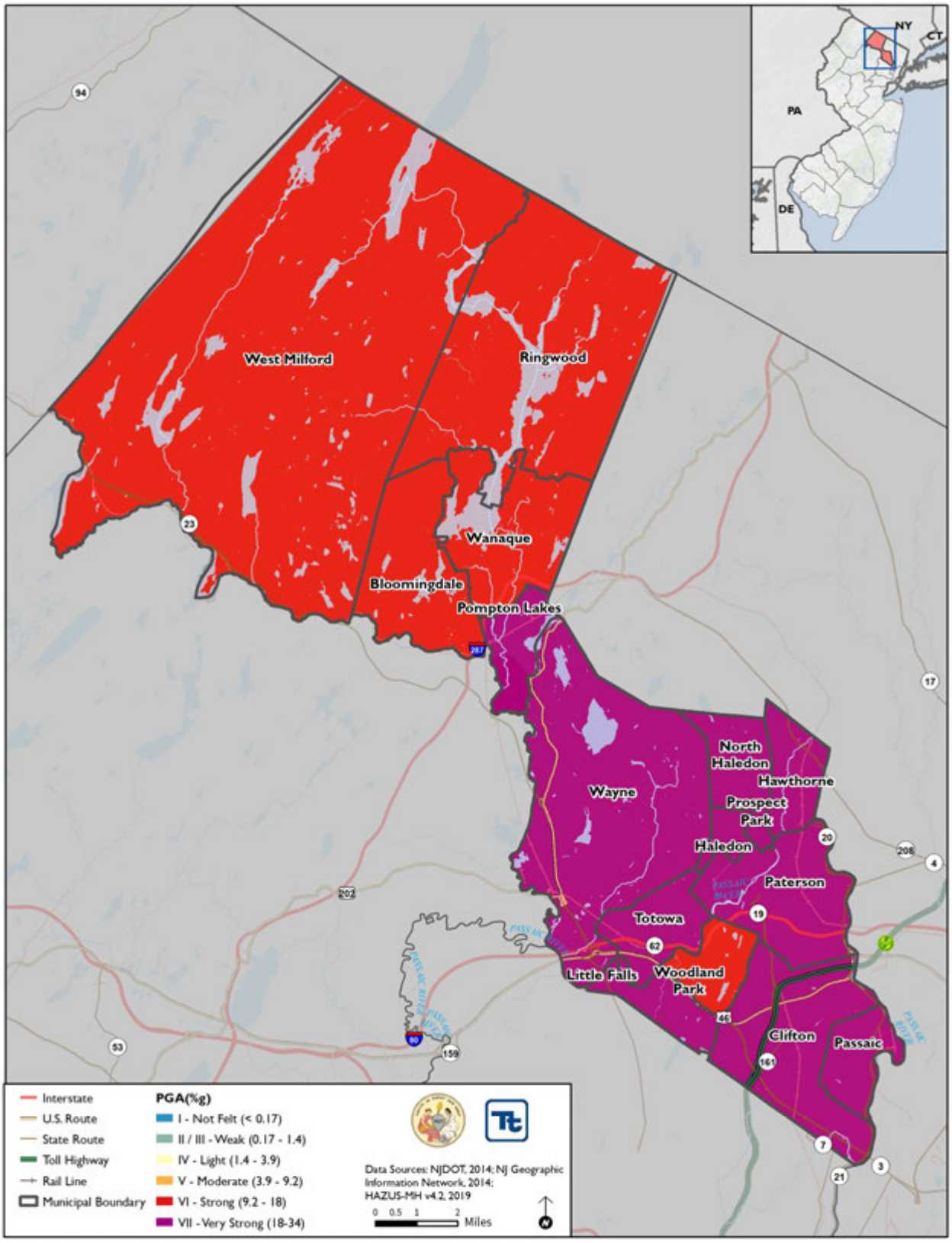


Figure 4.3.5-9. Peak Ground Acceleration 2,500-Year MRP for Passaic County



Previous Occurrences and Losses

New Jersey has a fairly extensive history of earthquakes. Small earthquakes occur several times a year and generally do not cause significant damage. The largest earthquake to impact New Jersey occurred in 1783. That earthquake, a magnitude 5.3 quake, occurred west of New York City and was felt from New Hampshire to Pennsylvania (Stover and Coffman 1993). Figure 4.3.5-10 illustrates earthquake events with epicenters located in New Jersey. Of the 178 events in the State, 14 earthquake epicenters were located in Passaic County. The majority of earthquakes that have occurred along faults in the central and eastern Highlands, with the Ramapo Fault being the most seismically active fault in the region (Volkert and Witte 2015), which is located within Passaic County.

The largest earthquake with its epicenter in Passaic County was a magnitude 2.7 quake centered in Pompton Lakes in 1947 (Stover and Coffman 1993; NJGWS 2014). The most recent earthquake with its epicenter in Passaic County occurred on July 18, 2014, and was located approximately 2.5 miles southwest of Ringwood.

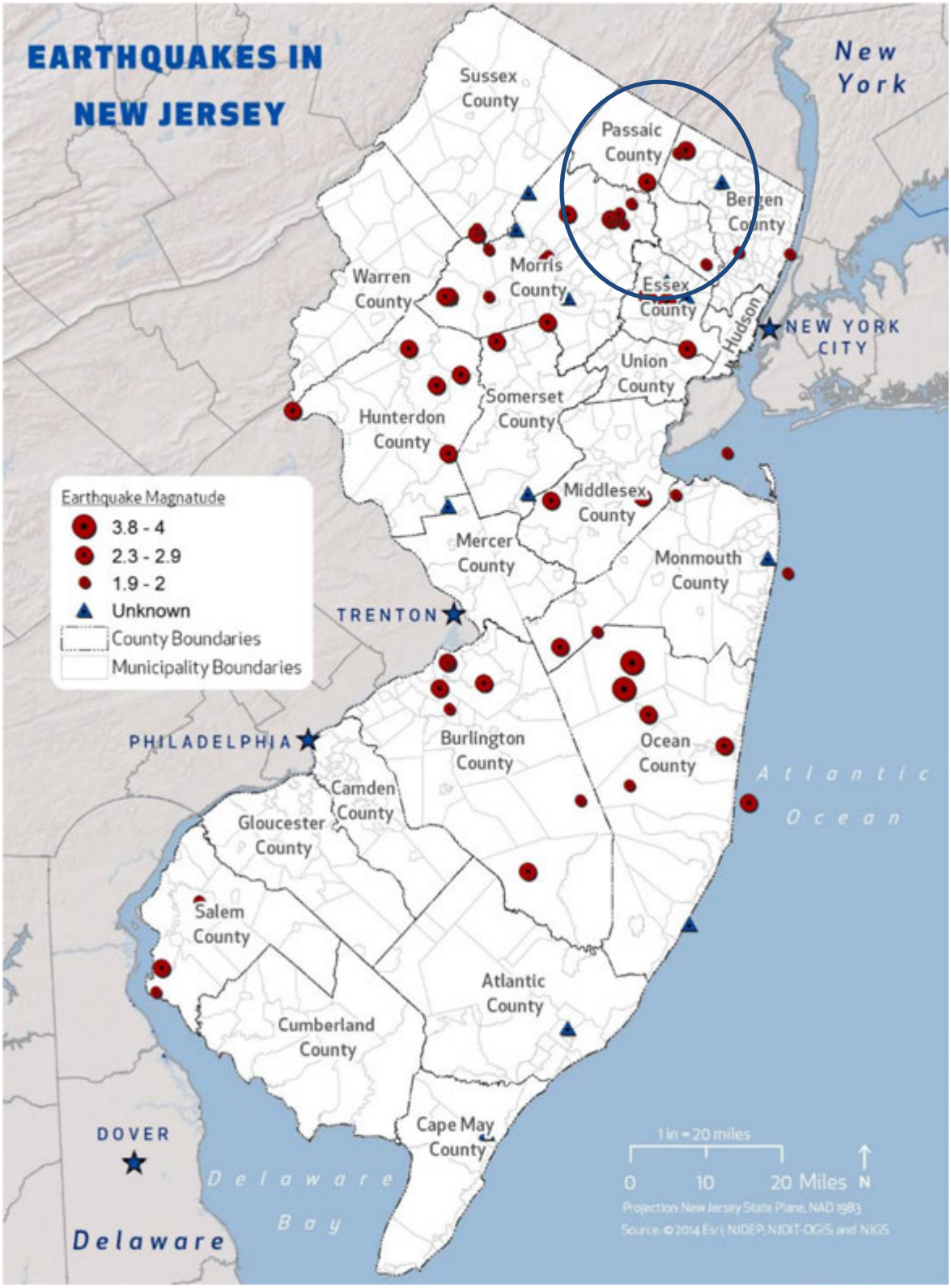
Earthquake events that have impacted Passaic County between 2014 and 2019 are listed in Table 4.3.5-6. The State of New Jersey has not been included in any FEMA DR or EM declarations for earthquake events. For events that occurred prior to 2014, refer to Appendix E (Risk Assessment Supplement). Not all earthquake events that may have been felt in Passaic County are included in the table below due to the extent of documentation and the fact that not all sources may have been identified or researched.

Table 4.3.5-6. Earthquake Events with Epi-Centers in Passaic County, 2014 to 2019

Date of Event	Magnitude Earthquake	FEMA Declaration Number	County Designated?	Epi-Center Location
July 18, 2014	0.8 Earthquake	N/A	N/A	Ringwood, New Jersey
February 19, 2016	1.1 Earthquake	N/A	N/A	Butler, New Jersey
February 21, 2016	0.5 Earthquake	N/A	N/A	Kinnelon, New Jersey
February 21, 2016	0.3 Earthquake	N/A	N/A	Kinnelon, New Jersey
February 21, 2016	0.4 Earthquake	N/A	N/A	Butler, New Jersey
February 24, 2016	0.4 Earthquake	N/A	N/A	Kinnelon, New Jersey
May 27, 2016	0.8 Earthquake	N/A	N/A	Kinnelon, New Jersey
June 25, 2016	0.8 Earthquake	N/A	N/A	Kinnelon, New Jersey
July 12, 2015	1.0 Earthquake	N/A	N/A	Wanaque, New Jersey
January 1, 2016	2.1 Earthquake	N/A	N/A	Ringwood, New Jersey
August 9, 2016	1.0 Earthquake	N/A	N/A	Wanaque, New Jersey
August 9, 2016	0.5 Earthquake	N/A	N/A	Butler, New Jersey
September 20, 2016	0.6 Earthquake	N/A	N/A	Ringwood, New Jersey
August 4, 2019	0.8 Earthquake	N/A	N/A	Pompton Lakes, New Jersey

Source: NJGWS 2019; USGS 2019
N/A Not Applicable/Not Available
NJ New Jersey

Figure 4.3.5-10. Earthquakes with Epicenters in Passaic County, 1783 to 2017



Source: *NJGWS 2019*

Note: *The blue circle indicates the location of Passaic County. The figure shows that several earthquakes have been epicentered in Passaic County.*

Probability of Future Occurrences

Earthquakes cannot be predicted and may occur any time of the day or year. The probability of damaging earthquakes affecting New Jersey and Passaic County is low. However, there is a definite threat of major earthquakes that could cause widespread damage and casualties in New Jersey. Major earthquakes are infrequent in the State and may occur only once every few hundred years or longer, but the consequences of major earthquakes would be very high.

In Section 4.4 (Hazard Ranking), the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for earthquake events in the County is considered 'rare' that have caused significant impacts to the County and its assets.

Climate Change Impacts

The potential impacts of global climate change on earthquake probability are unknown. Some scientists feel that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the Earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. National Aeronautics and Space Administration (NASA) and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes (NJOEM 2019).

Secondary impacts of earthquakes could be magnified by future climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity because of the increased saturation. Dams storing increased volumes of water from changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts (NJOEM 2019).

4.3.5.2 Vulnerability Assessment

A probabilistic assessment was conducted for the 100-, 500- and 2,500-year MRPs through a Level 2 analysis in HAZUS-MH v4.2 to analyze the earthquake hazard and provide a range of loss estimates. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess earthquake risk.

Impact on Life, Health, and Safety

The entire County may experience an earthquake. However, the degree of impact is dependent on many factors including the age and type of construction people live in, the soil types their homes are located on, and the intensity of the earthquake. Whether directly or indirectly impacted, residents could be faced with business closures, road closures that could isolate populations, and loss of function of critical facilities and utilities.

According to the 2017 American Community Survey annual estimate, Passaic County had a population of 510,562 people. Overall, risk to public safety and loss of life from an earthquake in the County is minimal for low magnitude events. However, there is a higher risk to public safety for those inside buildings due to structural damage or people walking below building ornamentations and chimneys that may be shaken loose and fall because of an earthquake.

As noted earlier, NEHRP Soil Classes D and E and Liquefaction Class 4 soils can amplify ground shaking to damaging levels even during a moderate earthquake, and thus increase risk to the population. Populations within municipalities located on NEHRP Class D and E soils and high liquefaction susceptible soils were estimated and are listed in Table 4.3.5-7 below (also refer to Figure 4.3.5-9). Overall, approximately 73,422 residents (14.4% of the County's population) reside on NEHRP class D and E soils. In addition, 8,867 people (1.7% of the County's

population) reside in areas of high susceptibility to liquefaction. The Borough of Pompton Lakes has the greatest percent of its population living on both NEHRP Class D and E soils (85.8% of total population) and Liquefaction Class 4 soils (11.3% of total population).

Table 4.3.5-7. Approximate Population within NEHRP and Liquefaction Areas

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed			
		NEHRP D&E Soils	% of Total	Liquefaction Class 4	% of Total
Bloomingdale, Borough of	8,139	0	0.0%	0	0.0%
Clifton, City of	86,207	14,874	17.3%	3	0.0%
Haledon, Borough of	8,440	0	0.0%	417	4.9%
Hawthorne, Borough of	19,065	3,749	19.7%	4	0.0%
Little Falls, Township of	14,524	1,502	10.3%	1,222	8.4%
North Haledon, Borough of	8,564	0	0.0%	0	0.0%
Passaic, City of	71,057	14,101	19.8%	2,375	3.3%
Paterson, City of	147,890	7,325	5.0%	369	0.2%
Pompton Lakes, Borough of	11,205	9,612	85.8%	1,267	11.3%
Prospect Park, Borough of	5,955	86	1.4%	0	0.0%
Ringwood, Borough of	12,451	0	0.0%	0	0.0%
Totowa, Borough of	10,829	2,347	21.7%	68	0.6%
Wanaque, Borough of	11,782	1,981	16.8%	0	0.0%
Wayne, Township of	55,154	15,941	28.9%	3,099	5.6%
West Milford, Township of	26,759	977	3.7%	0	0.0%
Woodland Park, Borough of	12,542	927	7.4%	43	0.3%
Passaic County (Total)	**510,562**	**73,422**	**14.4%**	**8,867**	**1.7%**

Sources: NJDEP/NJGWS 2015; American Community Survey 2013 – 2017 5-year Estimates
< Less than
NEHRP National Earthquake Hazard Reduction Program

Populations considered most vulnerable are those located in/near the built environment, particularly those near unreinforced masonry construction. Of these most vulnerable populations, socially vulnerable populations, including the elderly (persons over age 65) and individuals living below the poverty threshold, are most susceptible. Factors leadings to this higher susceptibility include decreased mobility and financial ability to react or respond during a hazard, and the location and construction quality of their housing. According to the 2013 – 2017 5-year American Community Survey (ACS) estimates, there are 86,667 total persons living below the poverty level and 69,429 persons over the age of 65 years in Passaic County.

As a result of an earthquake event, residents may be displaced or require temporary to long-term sheltering. The number of people requiring shelter is generally less than the number displaced as some displaced persons use hotels or stay with family or friends following a disaster event. Table 4.3.5-8 summarizes the households HAZUS-MH v4.2 estimates will be displaced and population that may require short-term sheltering for the 100-, 500- and 2,500-year MRP events. HAZUS-MH estimates there will be no displaced households or people seeking short-term shelter as a result of the 100-year MRP event.

Table 4.3.5-8. Estimated Number of Households Displaced and Persons Seeking Shelter During Earthquake Events

Scenario	Displaced Households	Persons Seeking Short-term Shelter
100-Year Earthquake MRP	0	0
500-Year Earthquake MRP	92	83
2,500-Year Earthquake MRP	1,129	1,018

Source: HAZUS-MH 4.2
Note:
MRP Mean return period
The number of displaced households and persons seeking shelter was calculated using the 2010 U.S. Census data (HAZUS-MH 4.2 default demographic data).

According to the 1999-2003 NYCEM Summary Report (*Earthquake Risks and Mitigation in the New York / New Jersey / Connecticut Region*), a strong correlation exists between structural building damage and number of injuries and casualties from an earthquake event. Further, the time of day also exposes different sectors of the community to the hazard. For example, HAZUS considers the residential occupancy at its maximum at 2:00 a.m., where the educational, commercial, and industrial sectors are at their maximum at 2:00 p.m., with peak commute time at 5:00 p.m. Whether directly impacted or indirectly impact, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could prevent people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage from an event itself.

There are no injuries or casualties estimated for the 100-year MRP event. Table 4.3.5-9 and Table 4.3.5-10 summarize the county-wide injuries and casualties estimated for the 500-year MRP and 2,500-year MRP earthquake events, respectively.

Table 4.3.5-9. Estimated Number of Injuries and Casualties from the 500-Year MRP Earthquake Event

Level of Severity	Time of Day		
	2:00 AM	2:00 PM	5:00 PM
Injuries	17	25	18
Hospitalization	2	3	2
Casualties	0	0	0

Source: HAZUS-MH 4.2

Table 4.3.5-10. Estimated Number of Injuries and Casualties from the 2,500-Year MRP Earthquake Event

Level of Severity	Time of Day		
	2:00 AM	2:00 PM	5:00 PM
Injuries	173	236	172
Hospitalization	27	40	29
Casualties	3	4	3

Source: HAZUS-MH 4.2

Impact on General Building Stock

The entire County's general building stock is considered at risk and exposed to this hazard. As stated earlier, soft soils (NEHRP soil classes D and E) can amplify ground shaking to damaging levels even during a moderate earthquake (NYCEM 2003). Therefore, buildings located on NEHRP soil classes D and E and high liquefaction susceptible soils are at increased risk of damage from an earthquake. Table 4.3.5-10 summarizes the number and replacement cost value of buildings in Passaic County located on NEHRP soils classes D and E and liquefaction class 4 soils.

There is a strong correlation between PGA and damage a building might undergo (NYCEM 2003). The HAZUS-MH model is based on best available earthquake science and aligns with these statements. The HAZUS-MH probabilistic earthquake model was applied to analyze effects from the earthquake hazard on general building stock in Passaic County. Refer to Figure 4.3.5-7 through Figure 4.3.5-9 earlier in this profile which illustrates the geographic distribution of PGA (g) across the County for 100-, 500- and 2,500-year MRP events at the Census-tract level.

A building's construction determines how well it can withstand the force of an earthquake. The NYCEM report indicates that unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward, whereas steel and wood buildings absorb more of the earthquake's energy. Additional attributes that affect a building's capability to withstand an earthquake's force include its age, number of stories, and quality of construction. HAZUS-MH v4.2 considers building construction and age of building as part of the analysis. Because a custom general building stock was used for this HAZUS-MH v4.2 analysis, the building ages and building types from the inventory were incorporated into the HAZUS-MH v4.2 model.

Table 4.3.5-10. Number of Buildings within NEHRP and Liquefaction Areas

Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed							
			Number of Buildings - NEHRP D&E Soils	% of Total	RCV - NEHRP D&E Soils	% of Total	Number of Buildings - Liquefaction Class 4	% of Total	RCV - Liquefaction Class 4	% of Total
Bloomingdale, Borough of	2,611	$1,784,142,939	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%
Clifton, City of	21,859	$21,649,495,205	2,812	12.9%	$3,634,386,595	16.8%	9	0.0%	$74,775,273	0.3%
Haledon, Borough of	1,809	$1,708,591,489	0	0.0%	$0	0.0%	97	5.4%	$227,781,995	13.3%
Hawthorne, Borough of	5,923	$4,588,063,085	1,085	18.3%	$1,167,842,961	25.5%	21	0.4%	$117,166,978	2.6%
Little Falls, Township of	3,412	$4,633,701,650	313	9.2%	$537,389,062	11.6%	324	9.5%	$190,088,565	4.1%
North Haledon, Borough of	2,698	$2,317,277,271	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%
Passaic, City of	6,918	$11,948,345,444	1,316	19.0%	$3,236,544,504	27.1%	164	2.4%	$548,244,658	4.6%
Paterson, City of	23,609	$55,984,762,201	1,935	8.2%	$10,378,159,968	18.5%	202	0.9%	$1,884,547,741	3.4%
Pompton Lakes, Borough of	3,081	$1,853,779,603	2,691	87.3%	$1,452,420,047	78.3%	427	13.9%	$206,801,933	11.2%
Prospect Park, Borough of	1,101	$709,318,581	19	1.7%	$55,995,688	7.9%	0	0.0%	$0	0.0%
Ringwood, Borough of	4,486	$2,724,021,483	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%
Totowa, Borough of	3,771	$6,476,350,669	867	23.0%	$1,250,418,714	19.3%	34	0.9%	$236,051,850	3.6%
Wanaque, Borough of	3,157	$2,211,149,264	567	18.0%	$626,502,724	28.3%	0	0.0%	$0	0.0%
Wayne, Township of	17,646	$19,125,773,073	4,754	26.9%	$7,086,817,603	37.1%	1,016	5.8%	$2,940,894,643	15.4%
West Milford, Township of	10,794	$9,348,319,367	451	4.2%	$633,245,914	6.8%	0	0.0%	$0	0.0%
Woodland Park, Borough of	3,473	$17,134,672,551	349	10.0%	$926,675,502	5.4%	17	0.5%	$42,215,476	0.2%
Passaic County (Total)	**116,348**	**$164,197,763,874**	**17,159**	**14.7%**	**$30,986,399,283**	**18.9%**	**2,311**	**2.0%**	**$6,468,569,113**	**3.9%**

Sources: NJDEP/NJGWS 2015; Passaic County; NJGIN MODIV 2018, Microsoft 2018, Open Street Map 2019, and RS Means 2019
Note: RCV = Replacement Cost Value; NEHRP = National Earthquake Hazard Reduction Program; % = Percent

Potential building damage was evaluated by HAZUS-MH 4.2 across the following damage categories: none, slight, moderate, extensive, and complete. Table 4.3.5-12 provides definitions of these five categories of damage for a light wood-framed building. Definitions for other building types are included in HAZUS-MH technical manual documentation. The results of potential damage for buildings in Passaic County categorized by general occupancy classes (i.e., residential, commercial, industrial, etc.) from HAZUS-MH v4.2 are summarized in Table 4.3.5-13.

Table 4.3.5-12. Example of Structural Damage State Definitions for a Light Wood-Framed Building

Damage Category	Description
Slight	Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple-wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS-MH Technical Manual

Table 4.3.5-13. Estimated Buildings Damaged by General Occupancy for the 500-Year and 2,500-Year MRP Earthquake Events

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	500-Year MRP		2,500-Year MRP	
			Building Count	Percent (%) Buildings in Occupancy Class	Building Count	Percent (%) Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	103,560	None	101,600	98.1%	87,677	84.7%
		Minor	1,564	1.5%	12,065	11.7%
		Moderate	347	0.3%	3,234	3.1%
		Severe	44	0.0%	506	0.5%
		Complete Destruction	4	0.0%	78	0.1%
Commercial Buildings	8,039	None	7,717	96.0%	6,320	78.6%
		Minor	237	3.0%	1,021	12.7%
		Moderate	75	0.9%	571	7.1%
		Severe	9	0.1%	113	1.4%
		Complete Destruction	1	0.0%	13	0.2%
Industrial Buildings	1,558	None	1,483	95.2%	1,187	76.2%
		Minor	53	3.4%	205	13.2%
		Moderate	19	1.2%	133	8.5%
		Severe	3	0.2%	31	2.0%
		Complete Destruction	0	0.0%	3	0.2%
Government, Religion, Agricultural, and Education Buildings	3,180	None	3,062	96.3%	2,543	80.0%
		Minor	86	2.7%	378	11.9%
		Moderate	28	0.9%	209	6.6%

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	500-Year MRP		2,500-Year MRP	
			Building Count	Percent (%) Buildings in Occupancy Class	Building Count	Percent (%) Buildings in Occupancy Class
		Severe	4	0.1%	44	1.4%
		Complete Destruction	0	0.0%	5	0.2%

Source: HAZUS-MH 4.2
Notes:
< Less than
MRP Mean return period

Building damage as a result of the 100-, 500-, and 2,500-year MRP earthquakes were estimated for each municipality using HAZUS-MH v4.2; refer to Table 4.3.5-14. Damage loss estimates include structural and non-structural damage to the building and loss of contents.

Table 4.3.5-14. Estimated Building Damages (Structure and Contents) from the 100-, 500- and 2,500-Year MRP Earthquake Events

Municipality	Estimated Total Damages (All Occupancies)						
	Total RCV	100-Year	% Total	500-Year	% Total	2,500-Year	% Total
Bloomingdale, Borough of	$1,784,142,939	$0	0.0%	$445,754	0.0%	$9,132,213	0.5%
Clifton, City of	$21,649,495,205	$0	0.0%	$19,267,698	0.1%	$304,113,756	1.4%
Haledon, Borough of	$1,708,591,489	$0	0.0%	$1,275,062	0.1%	$20,438,146	1.2%
Hawthorne, Borough of	$4,588,063,085	$0	0.0%	$3,990,712	0.1%	$64,198,583	1.4%
Little Falls, Township of	$4,633,701,650	$0	0.0%	$3,116,888	0.1%	$51,652,066	1.1%
North Haledon, Borough of	$2,317,277,271	$0	0.0%	$1,563,539	0.1%	$26,088,786	1.1%
Passaic, City of	$11,948,345,444	$0	0.0%	$12,868,045	0.1%	$188,326,446	1.6%
Paterson, City of	$55,984,762,201	$0	0.0%	$52,688,404	0.1%	$784,303,319	1.4%
Pompton Lakes, Borough of	$1,853,779,603	$51,225	0.0%	$2,709,280	0.1%	$35,827,007	1.9%
Prospect Park, Borough of	$709,318,581	$0	0.0%	$341,394	0.0%	$6,318,790	0.9%
Ringwood, Borough of	$2,724,021,483	$0	0.0%	$855,204	0.0%	$17,206,071	0.6%
Totowa, Borough of	$6,476,350,669	$0	0.0%	$5,672,806	0.1%	$89,098,050	1.4%
Wanaque, Borough of	$2,211,149,264	$0	0.0%	$845,445	0.0%	$16,275,104	0.7%
Wayne, Township of	$19,125,773,073	$98	0.0%	$18,644,953	0.1%	$283,101,858	1.5%
West Milford, Township of	$9,348,319,367	$0	0.0%	$3,036,016	0.0%	$57,972,037	0.6%
Woodland Park, Borough of	$17,134,672,551	$0	0.0%	$6,007,795	0.0%	$126,173,792	0.7%
Passaic County (Total)	**$164,197,763,874**	**$51,322**	**0.0%**	**$133,328,997**	**0.1%**	**$2,080,226,025**	**1.3%**

Source: *HAZUS-MH 4.2*
Notes:
< *Less than*
MRP *Mean return period*
**Total Damages is the sum of damages for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government).*

HAZUS-MH v4.2 estimates there may be an estimated $133.3 million in damages to buildings as a result of a 500-year earthquake event. This includes structure and content damages and accounts for less than 1% of total replacement cost value in Passaic County. For a 2,500-year MRP earthquake event, HAZUS-MH estimates greater than $2 billion in potential building damage, approximately 1.3% of the total general building stock replacement cost value.

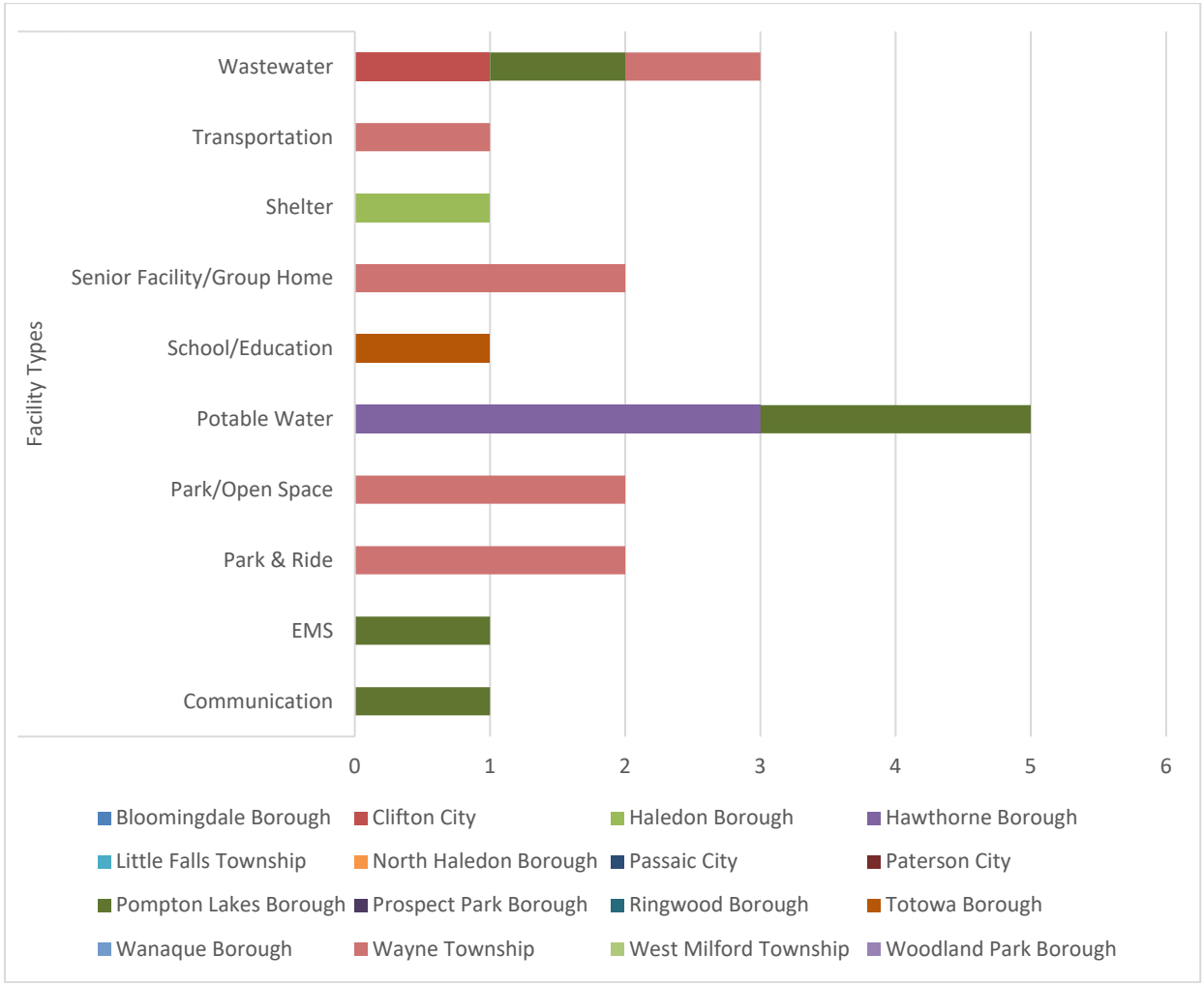
Historically, Building Officials Code Administration (BOCA) regulations in the northeast states were developed to address local concerns, including heavy snow loads and wind. Seismic requirements for design criteria are not as stringent as those of the west coast of the United States, which rely on the more seismically focused Uniform Building Code. As such, a smaller earthquake in the northeast can cause more structural damage than if it would occur in the west.

Impact on Critical Facilities

All critical facilities in Passaic County are considered exposed to the earthquake hazard. Refer to subsection "Critical Facilities" in Section 3 (County Profile) of this HMP for a complete inventory of critical facilities in Passaic County.

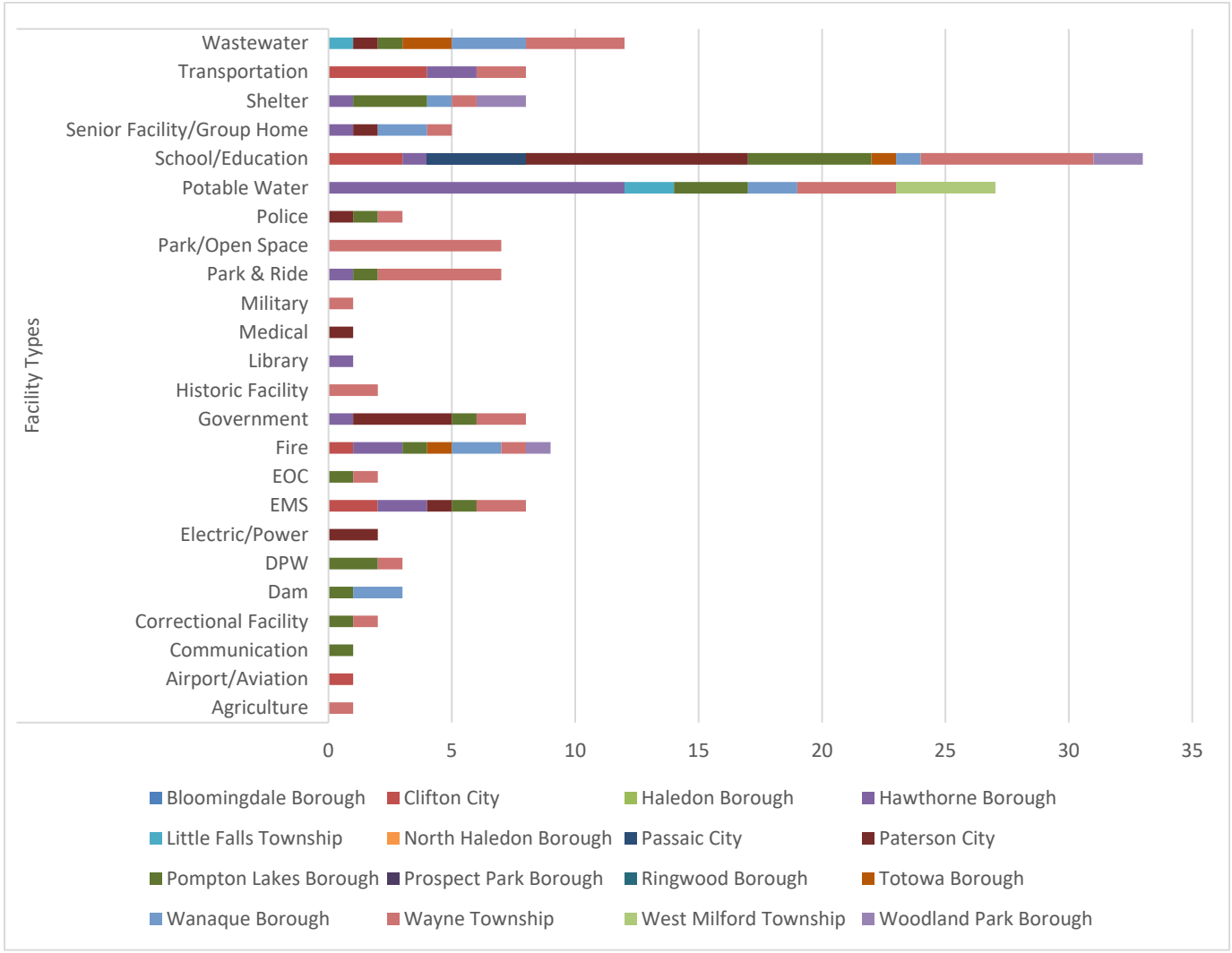
Two sets of exposure analyses were conducted for critical facilities. The first analysis reviewed the number of critical facilities constructed on NEHRP classes D or E soils and liquefaction class 4 soils. Of the 903 critical facilities in the County, 155 are located on NEHRP classes D or E soils and 19 are located on liquefaction class 4 soils. Furthermore, 78 of the critical facilities located on NEHRP classes D or E soils and 12 of the critical facilities located on the liquefaction class 4 soils are considered lifelines for the County. Appendix E (Risk Assessment Supplement) summarizes the number of critical facilities, by type, located on NEHRP Soil classes D or E and liquefaction class 4 soils. Figures summarizing the number of critical facilities by type per municipality in Passaic County located on Liquefaction class 4 soils and NEHRP soil class D or E are illustrated by Figure 4.3.5-11 and Figure 4.3.5-12, respectively.

Figure 4.3.5-11. Number of Critical Facilities Located in the Liquefaction Class 4 Hazard Area



Source: Passaic County, NJDEP/NJGWS 2015
Notes: EOC = Emergency Operation Centers, EMS = Emergency Management Services, DPW = Department of Public Works

Figure 4.3.5-12. Number of Critical Facilities Located in the NEHRP Class D and E Soil Type Hazard Area



Source: Passaic County, NJDEP/NJGWS 2015
Notes: EOC = Emergency Operation Centers, EMS = Emergency Management Services, DPW = Department of Public Works

An exposure analysis was conducted to estimate the number of miles major transportation routes that are built on soft or loose soils most vulnerable to impacts from earthquake events; refer to Table 4.3.5-19. According to the exposure analysis, Interstate 80, NJ Route 21, U.S. Route 46, Garden State Parkway, NJ Route 7, and NJ State Highway 23 are located on NEHRP soil classes D and E. Overall, there are 18.9 miles or 34-percent of the total highway miles in Passaic County (i.e., 55 miles of highway) that are built on soft soils classified as NEHRP D and E soil types and at risk of severe ground shaking from earthquake events. Additionally, there are 0.4 miles or 0.8-percent of the total highway miles in Passaic County that are built on wet and loose soils classified as Class 4 liquefaction soils.

Table 4.3.5-19. Miles of Major Transportation Routes Exposed to Earthquake Hazard Areas

Road Type	Total Miles in Passaic County	Exposure to NEHRP Soils & Class 4 Liquification Hazard Area					
		NEHRP Class E Soils	% of Total	NEHRP Class D Soils	% of Total	Class 4 Liquefaction Soils	% of Total
Highways	55.5	0.5	0.9%	18.4	33.1%	0.4	0.8%

Source: Passaic County, NJDEP/NJGWS 2015, NJDOT 2016

The HAZUS-MH v4.2 earthquake model was used to assign a probability of each damage state category defined in Table 4.3.5-15 through Table 4.3.5-17 to every critical facility in the planning area for the 100-, 500-, and 2,500-year MRP events, which was then averaged across the facility category. In addition, HAZUS-MH v4.2 estimates the time to restore critical facilities to fully functional use. Results are presented as a probability of being functional at specified time increments (days after the event). For example, HAZUS-MH v4.2 might estimate that a facility has 5% chance of being fully functional at Day 3, and a 95% chance of being fully functional at Day 90. For percent probability of sustaining damage, the minimum and maximum damage estimated value for that facility type is presented.

As a result of a 100-year MRP event, HAZUS-MH v4.2 estimates that critical facilities will be nearly 100-percent functional with negligible damages. Therefore, the impact to critical facilities is not significant for the 100-year event. Whereas, for the 500- and 2,500-year MRP events, functionality can approximately decrease as low as 20- and 70-percent, respectively.

Table 4.3.5-15. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities in Passaic County for the 100-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	97-99	1-2	0-1	<1	0	97-99	99-100	100	100
Police	97-99	1-2	0-1	<1	<1	97-99	99-100	100	100
Fire	97-100	0-2	0-1	<1	<1	97-100	99-100	100	100
EOC	99.7-99.8	<1	<1	0	0	100	100	100	100
School	99-100	0-1	<1	<1	0	99-100	100	100	100
Utilities									
Potable	99.9-100	<1	<1	0	0	100	100	100	100
Wastewater	99.8-100	<1	<1	0	0	100	100	100	100
Electric	99.8-100	<1	<1	0	0	100	100	100	100

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Communication	99.9-100	<1	<1	0	0	100	100	100	100

Source: HAZUS-MH 4.2
Notes:
< Less than
EOC Emergency Operations Center

Table 4.3.5-16. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities in Passaic County for the 500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	78-91	6-13	3-7	0-2	<1	78-91	90-97	98-100	99-100
Police	78-90	6-13	3-7	0-2	<1	78-90	90-97	98-100	99-100
Fire	78-96	3-13	1-7	0-2	<1	78-96	91-99	98-100	99-100
EOC	94-96	3-5	1	<1	<1	94-96	98-99	100	100
School	97-99	1-9	0-4	0-1	<1	87-99	96-100	99-100	100
Utilities									
Potable	97-100	0-2	<1	<1	0	99-100	100	100	100
Wastewater	93-100	0-5	0-2	<1	<1	95-100	100	100	100
Electric	93-100	0-5	0-2	<1	<1	98-100	100	100	100
Communication	98-100	0-2	<1	<1	0	100	100	100	100

Source: HAZUS-MH 4.2
Notes:
< Less than
EOC Emergency Operations Center
MRP Mean return period

Table 4.3.5-17. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities in Passaic County for the 2,500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
Medical	31-65	18-23	12-25	4-13	1-9	31-65	53-83	79-96	85-98
Police	26-65	18-23	12-25	4-13	1-24	26-65	44-89	65-96	71-98
Fire	29-92	11-23	6-25	1-13	0-15	29-92	50-93	74-99	80-99
EOC	60-75	14-19	8-12	2-3	0-7	60-75	79-90	90-98	92-99
School	39-91	7-25	2-21	0-7	0-12	39-91	62-97	81-100	85-100
Utilities									
Potable	61-98	2-14	0-10	0-1	0-18	71-99	84-100	85-100	91-100

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Wastewater	36-98	2-16	0-23	0-5	0-21	44-98	75-100	76-100	81-100
Electric	36-98	2-16	0-23	0-5	0-21	58-99	77-100	80-100	95-100
Communication	74-98	2-14	0-11	0-1	0-1	93-100	99-100	99-100	100

Source: HAZUS-MH 4.2
Notes:
< Less than
EOC Emergency Operations Center
MRP Mean return period

Impact on Economy

Earthquakes also have impacts on the economy, including loss of business function, damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings. HAZUS-MH v4.2 estimates building-related economic losses, including income losses (wage, rental, relocation, and capital-related losses) and capital stock losses (structural, non-structural, content, and inventory losses). Economic losses estimated by HAZUS-MH v4.2 are summarized in Table 4.3.5-19.

Table 4.3.5-19. Economic Losses for Earthquake MRP Events

Level of Severity	Mean Return Period		
	100-year	500-year	2,500-year
Income Losses			
Wage	$2,800	$300,940	$2,711,760
Capital Related	$1,700	$111,310	$1,041,970
Rental	$3,400	$739,170	$6,373,260
Relocation	$9,800	$1,522,170	$13,946,930
Subtotal	**$17,700**	**$2,676,190**	**$24,073,920**
Capital Stock Losses			
Structural	$19,200	$3,450,440	$29,892,960
Non-Structural	$27,900	$6,763,410	$110,136,460
Content	$3,600	$3,118,990	$67,993,120
Inventory	$0	$117,180	$2,345,820
Subtotal	**$50,700**	**$13,450,020**	**$210,368,360**

Source: HAZUS-MH v4.2

Although the HAZUS-MH v4.2 analysis did not compute damage estimates for individual roadway segments and railroad tracks, assumedly these features would undergo damage due to ground failure, resulting in interruptions of regional transportation and of distribution of materials. Losses to the community that would result from damage to lifelines could exceed costs of repair (FEMA 2012).

Earthquake events can significantly affect road bridges, many of which provide the only access to certain neighborhoods. Because softer soils generally follow floodplain boundaries, bridges that cross watercourses should be considered vulnerable. Another key factor in degree of vulnerability is age of facilities and infrastructure, which correlates with standards in place at times of construction of these. HAZUS-MH estimated

economic impacts to Passaic County for 15-years after the earthquake event, including impacts to transportation infrastructure.

In terms of the transportation infrastructure, HAZUS-MH estimates $30,000, $1.82 million, $15.48 million in economic losses to bridges, highways, railways, light rail, bus, ferry, port, and airport facilities in Passaic County for the 100-year, 500-year, and 2,500-year MRP earthquake events, respectively. Utility systems, including potable water, wastewater, natural gas, oil systems, electrical power, and communication systems, are estimated to experience approximately $30,000, $8.64 million, $182 million in economic losses during the 100-year, 500-year, and 2,500-year MRP earthquake events, respectively.

HAZUS-MH 4.2 also estimates the volume of debris that may be generated as a result of an earthquake event to enable the study region to prepare and rapidly and efficiently manage debris removal and disposal. Debris estimates are divided into two categories: (1) reinforced concrete and steel that require special equipment to break it up before it can be transported, and (2) brick, wood, and other debris that can be loaded directly onto trucks with bulldozers (HAZUS-MH Earthquake User's Manual 2020).

For the 100-year MRP event, HAZUS-MH 4.2 estimates that debris will only be generated for the Borough of Pompton Lakes (approximately 32 tons of brick and wood and 7 tons of steel and concrete). For the 500-year MRP event, HAZUS-MH 4.2 estimates more than 50,000 tons of debris will be generated county-wide. For the 2,500-year MRP event, HAZUS-MH 4.2 estimates greater than 440,000 tons of debris will be generated county-wide. Table 4.3.5-21 summarizes the estimated debris generated as a result of these events by municipality.

Table 4.3.5-21. Estimated Debris Generated by the 100- year 500- and 2,500-year MRP Earthquake Events

Municipality	100-Year		500-Year		2,500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)	Brick/Wood (tons)	Concrete/Steel (tons)	Brick/Wood (tons)	Concrete/Steel (tons)
Bloomingdale, Borough of	0	0	201	53	1,297	524
Clifton, City of	0	0	5,491	2,353	35,418	25,311
Haledon, Borough of	0	0	412	154	2,577	1,557
Hawthorne, Borough of	0	0	1,142	452	7,467	4,891
Little Falls, Township of	0	0	999	381	6,584	4,093
North Haledon, Borough of	0	0	508	152	3,216	1,561
Passaic, City of	0	0	3,617	1,575	23,935	19,146
Paterson, City of	0	0	15,525	6,747	101,037	76,171
Pompton Lakes, Borough of	32	7	638	223	4,389	3,066
Prospect Park, Borough of	0	0	126	33	810	337
Ringwood, Borough of	0	0	354	90	2,321	903
Totowa, Borough of	0	0	1,660	793	10,784	8,443
Wanaque, Borough of	0	0	326	104	2,228	1,117
Wayne, Township of	0	0	5,262	1,996	35,531	25,131
West Milford, Township of	0	0	1,209	360	8,072	3,691
Woodland Park, Borough of	0	0	2,632	674	18,273	7,628
Passaic County (Total)	**32**	**7**	**40,103**	**16,139**	**263,938**	**183,570**

Source: HAZUS-MH 4.2
Notes: MRP Mean return period

Impact on the Environment

According to USGS, earthquakes can cause damage to the surface of the Earth in various forms depending on the magnitude and distribution of the event (USGS 2020). Surface faulting is one of the major seismic components to earthquakes that can create wide ruptures in the ground. Ruptures can have a direct impact on the landscape and natural environment because it can disconnect habitats for miles isolating animal species or tear apart plant roots.

Furthermore, ground failure as a result of soil liquefaction can have an impact on soil pores and retention of water resources (USGS 2020). The greater the seismic activity and liquefaction properties of the soil, the more likely drainage of groundwater can occur which depletes groundwater resources. In areas where there is higher pressure of groundwater retention, the pores can build up more pressure and make soil behave more like a fluid rather than a solid increasing risk of localized flooding and deposition or accumulation of silt (USGS 2020).

An exposure analysis was conducted to understand the percent of County land that has soft or loose soil types that magnify the impacts earthquake events; refer to Table 4.3.5-21.

Table 4.3.5-21. Total Acres of Passaic County That Are Classified as Earthquake Hazard Areas

Total Acres of Passaic County	Earthquake Hazard Areas	Acres Exposed	Percent (%) Total
126,936	NEHRP Class D Soil	9,802	7.7%
	NEHRP Class E Soil	1,168	0.9%
	Liquefaction Class 4 Soil	3,438	2.7%

Source: Passaic County, NLCD 2016, NJDEP/NJGWS 2015

Future Growth and Development

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Passaic County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes).

According to the data provided by the communities, three of the proposed new development projects are planned to be built on NEHRP class D soils, which may make them vulnerable to more intense ground shaking during an earthquake event. As discussed, development built in areas with softer NEHRP soil classes, liquefaction, and

landslide-susceptible areas may experience shifting or cracking in the foundation during earthquakes because of the loose soil characteristics of these soil classes. However, current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older, existing construction that may have been built to lower construction standards.

Refer to Section 3, and Volume II Section 9 for more information about the potential new development in Passaic County. Figure 4.3.5-13 and Figure 4.3.5-14 illustrate the potential new development and NEHRP soils, liquefaction, and landslide-susceptible areas across the County.

Projected Changes in Population

The County has and is projected to continue experiencing population growth. As noted above, vulnerability greatly depends upon the location residents reside. The Boroughs of Bloomingdale, Wanaque and Woodland Park have experienced the greatest percentage of growth since 2010; greater than 5% each. Populations moving to Passaic County and living in older buildings may be vulnerable to this hazard. As noted earlier, if moving into new construction, current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts.

Climate Change

Because the impacts of climate change on earthquakes are not well understood, a change in the County's vulnerability as the climate continues to change is difficult to determine. However, climate change has the potential to magnify secondary impacts of earthquakes. As a result of the climate change projections discussed above, the County's assets located on areas of saturated soils and on or at the base of steep slopes, are at a higher risk of landslides/mudslides because of seismic activity. Refer to Section 4.3.8 for additional discussion of the geological hazard.

Vulnerability Change Since the 2015 HMP

Overall, the entire County continues to be vulnerable to earthquakes. Several differences exist between the 2015 plan and this update. For the 2020 HMP, the exposure analyses were conducted using 2013-2017 American Community Survey 5-year population estimates. The building inventory was updated using RS Means 2019 values, which is more current and reflects replacement cost versus the building stock improvement values reported in the 2015 HMP. Additional building stock updates include updates to the critical facility inventory provided by Passaic County. Updated hazard areas were used as well; since the 2015 HMP, the NJGWS has released updated NEHRP and liquefaction susceptible soils data. Updates to the data expands the geographical extent of liquefaction classes, no longer delineating the hazard areas by census boundaries. The updated data was used for the exposure analysis and to update HAZUS-MH's default earthquake data. An updated version of FEMA's HAZUS-MH earthquake module (version 4.2) was utilized to estimate potential losses for these updated asset inventories. This updated model includes longer historical records to pull from to generate probabilistic events.

Overall, the 2020 HMP vulnerability assessment, provides a more accurate estimated exposure and earthquake potential losses for Passaic County.

Figure 4.3.5-13. Potential New Development in Passaic County and NEHRP Soil Types

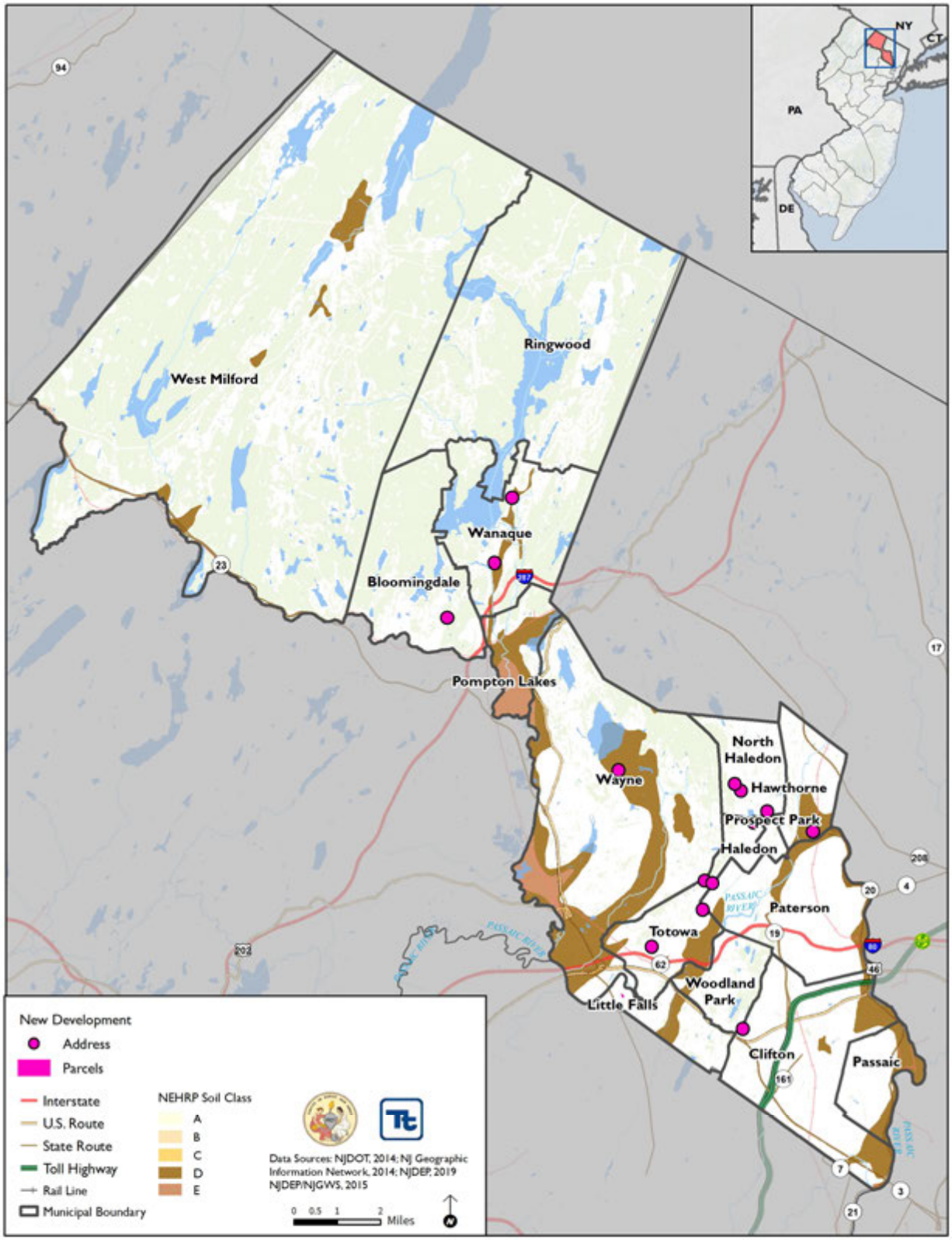
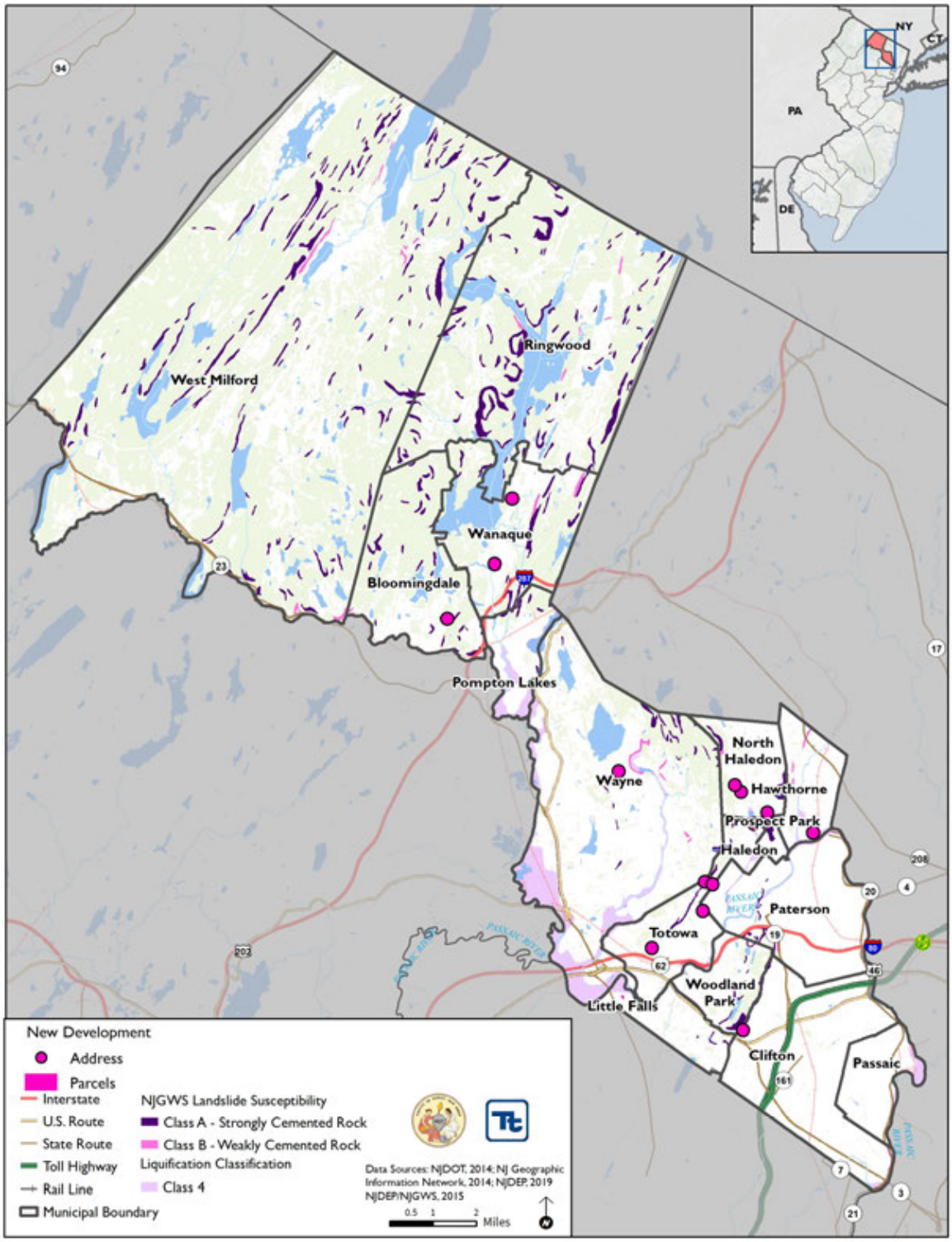


Figure 4.3.5-14. Potential New Development in Passaic County Located in Liquefaction Susceptible Areas



4.3.6 Extreme Temperatures

The following section provides the hazard profile and vulnerability assessment for the extreme temperature hazard in Passaic County.

2020 HMP Changes

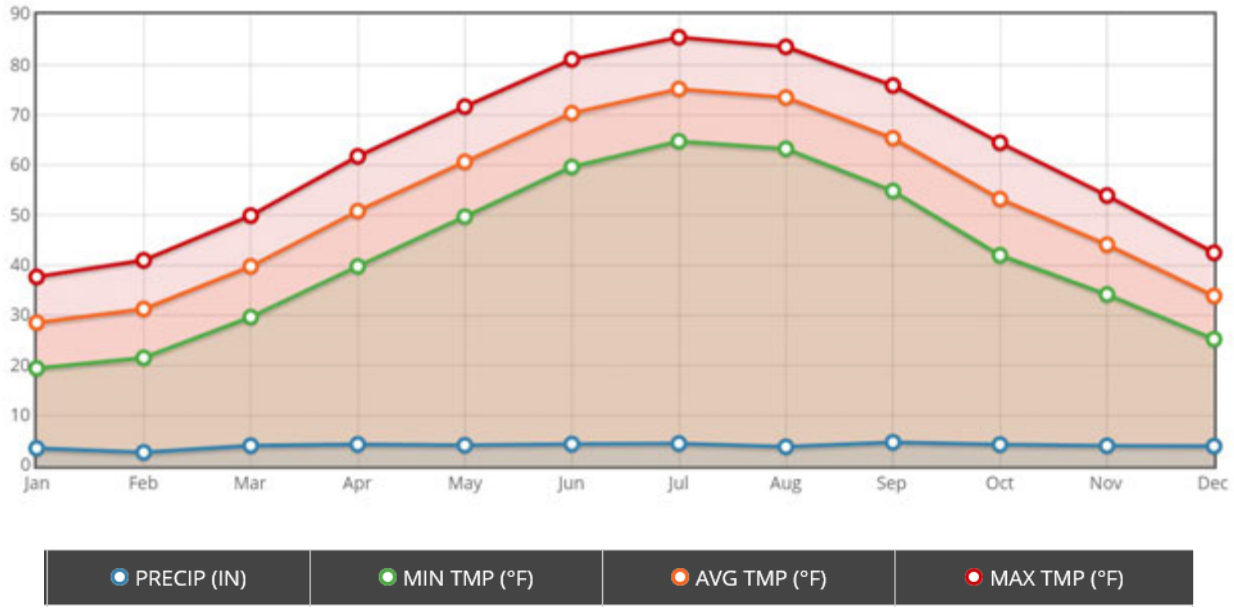
- All subsections have been updated using best available data.
- Previous occurrences are updated with events that occurred between 2014 and 2019.
- The NJTPA Climate Resilience Planning Study has been integrated.

4.3.6.1 Profile

Hazard Description

Extreme temperature includes both heat and cold events that can have significant direct impacts to human health and commercial/agricultural businesses and primary and secondary effects on infrastructure (e.g., burst pipes and power failure). Distinguishing characteristics of "extreme cold" or "extreme heat" vary by location, based on the conditions to which the population is accustomed. Figure 4.3.6-1 shows the average temperature each month at the Little Falls station in Passaic County.

Figure 4.3.6-1. Average Temperature in Little Falls, Passaic County, New Jersey



Source: NWS 2020

Extreme Cold

Extreme cold events are when temperatures drop well below normal in an area. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Extreme cold temperatures are generally characterized in temperate zones by the ambient air temperature dropping to approximately 0ºF or below (Centers of Disease Control and Prevention [CDC] 2007). Extremely cold temperatures often accompany a winter storm, which can cause power failures and icy roads. Although staying indoors as much as possible can help

reduce the risk of car crashes and falls on the ice, individuals may also face indoor hazards. Many homes will be too cold—either due to a power failure or because the heating system is not adequate for the weather. The use of space heaters and fireplaces to keep warm increases the risk of household fires and carbon monoxide poisoning (CDC 2007).

Extreme Heat

Extreme heat is defined as temperatures which hover 10 degrees or more above the average high temperature for a region and that last for several weeks (Centers for Disease Control and Prevention [CDC] 2016). A heat wave is defined as a period of abnormally and uncomfortably hot and unusually humid weather. Typically, a heat wave lasts two or more days. (National Weather Service [NWS] 2009). There is no universal definition of a heat wave because the term is relative to the usual weather in a particular area. The term heat wave is applied both to routine weather variations and to extraordinary spells of heat which may occur only once a century (Meehl and Tebaldi 2004).

Urbanized areas and urbanization create an exacerbated type of risk during an extreme heat event, compared to rural and suburban areas. As defined by the U.S. Census, urban areas are classified as all territory, population, and housing units located within urbanized areas and urban clusters. The term urbanized area denotes an urban area of 50,000 or more people. Urban areas under 50,000 people are called urban clusters. The U.S. Census delineates urbanized area and urban cluster boundaries to encompass densely settled territory, which generally consists of:

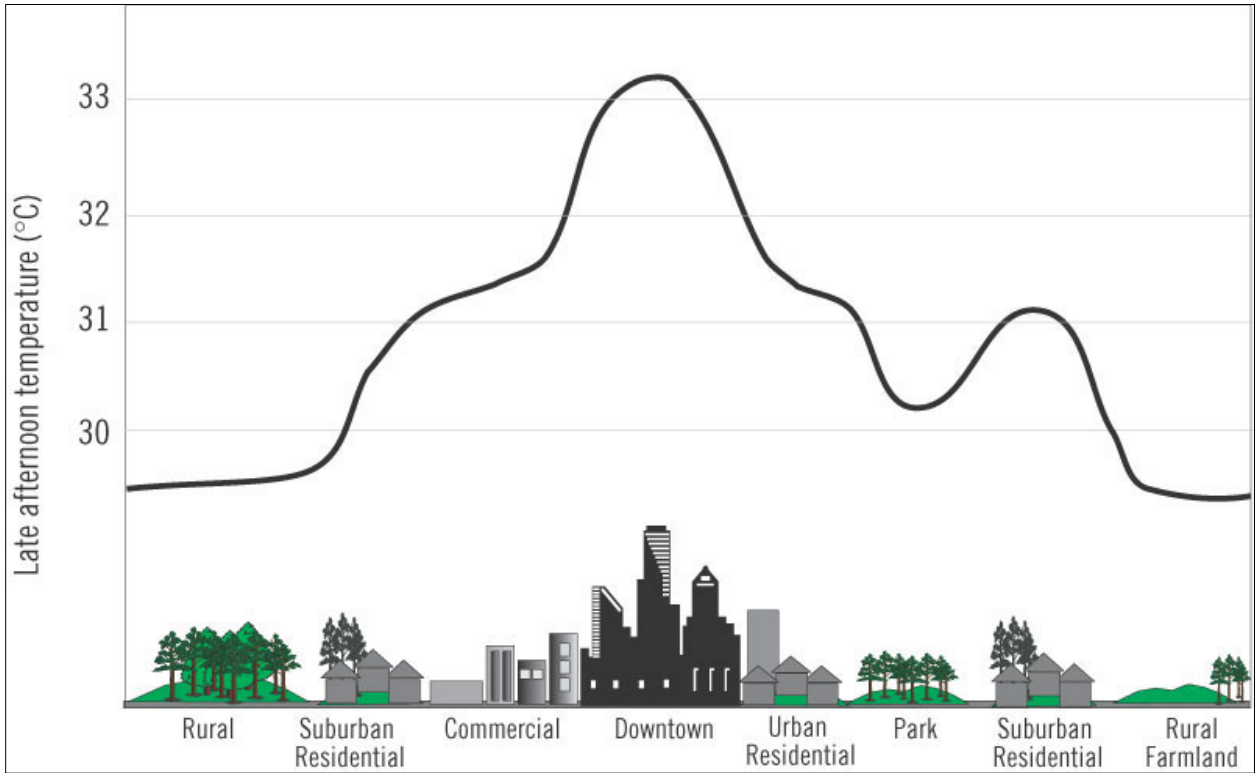
- A cluster of one or more block groups or census blocks each of which has a population density of at least 1,000 people per square mile at the time.
- Surrounding block groups and census blocks each of which has a population density of at least 500 people per square mile at the time.
- Less densely settled blocks that form enclaves or indentations or are used to connect discontinuous areas with qualifying densities (U.S. Census 2010).

As these urban areas develop and change, so does the landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist are now impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas. This forms an 'island' of higher temperatures (U.S. Environmental Protection Agency [EPA] 2009).

The term 'heat island' describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with more than one million people can be between 1.8 ºF and 5.4ºF warmer than its surrounding areas. In the evening, the difference in air temperatures can be as high as 22ºF. Heat islands occur on the surface and in the atmosphere. On a hot, sunny day, the sun can heat dry, exposed urban surfaces to temperatures 50ºF to 90ºF hotter than the air. Heat islands can affect communities by increasing peak energy demand during the summer, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and death, and water quality degradation (EPA 2010 and 2011).

Figure 4.3.6-2 below illustrates an urban heat island profile. The graphic demonstrates that heat islands are typically most intense over dense urban areas. Further, vegetation and parks within a downtown area may help reduce heat islands (U.S. EPA 2019).

Figure 4.3.6-2. Urban Heat Island Profile



Source: EPA 2019
ºC degrees Celsius

Location

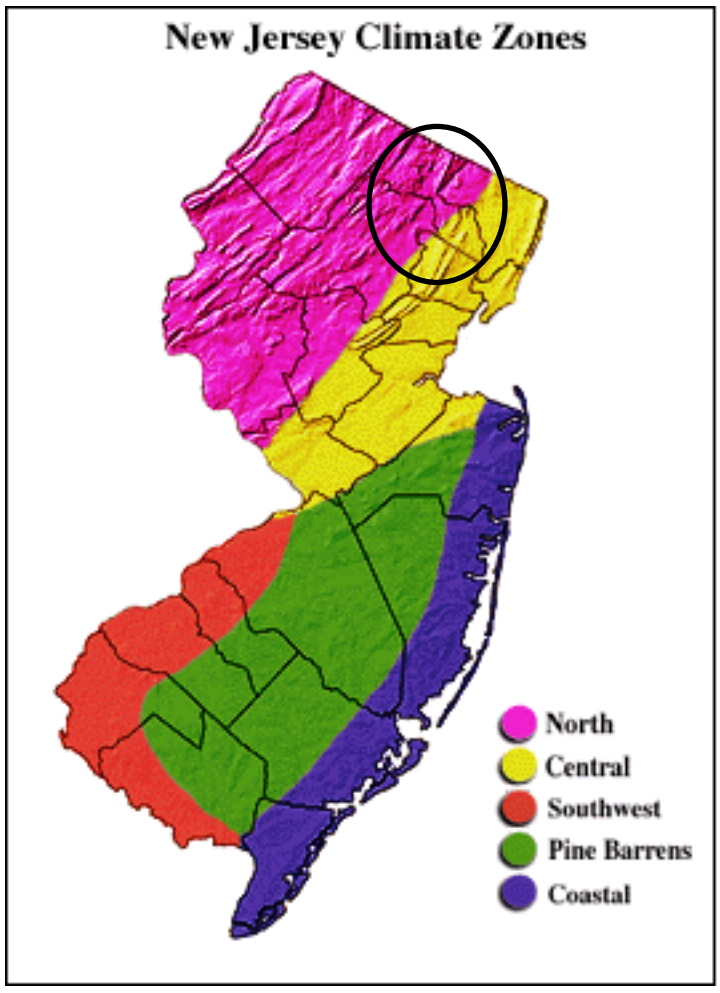
According to the ONJSC, New Jersey has five distinct climate regions. Elevations, latitude, distance from the Atlantic Ocean, and landscape (e.g. urban, sandy soil) produce distinct variations in the daily weather between each of the regions. The five regions include: Northern, Central, Pine Barrens, Southwest, and Coastal (ONJSC Rutgers University, Date Unknown). Figure 4.3.6-3 depicts these regions. A majority of Passaic County is located within the North Climate Zone with the southeastern portion located in the Central Climate Region.

The Northern Climate Zone covers about one-quarter of New Jersey and consists mainly of elevated highlands and valleys which are part of the Appalachian Uplands. Surrounded by land, this region can be characterized as having a continental type of climate with minimal influence from the Atlantic Ocean, except when the winds contain an easterly component. Being in the northernmost portion of the state, and with small mountains up to 1800 feet in elevation, the Northern Zone normally exhibits a colder temperature regime than other climate regions of the State. This difference is most dramatic in winter when average temperatures in the Northern Zone can be more than ten degrees Fahrenheit cooler than in the Coastal Zone (ONJSC Rutgers University n.d.).

The Northern Climate Zone usually has the shortest growing season, about155 days. The average date for the last killing spring frost is May 4. The first frost in fall is around October 7. The exact dates vary significantly within the region as well as from year to year. Some valley locations have observed killing frost in mid-September and as late as mid-June (ONJSC Rutgers University n.d.).

The Central Zone has a northeast to southeast orientation, running from New York Harbor and the Lower Hudson River to the great bend of the Delaware River in the vicinity of Trenton. This region has many urban locations with large amounts of pollutants produced by the high volume of traffic and industrial establishments. The concentration of buildings and impervious surfaces tend to retain more heat; thereby, affecting the local temperatures. The observed nighttime temperatures in heavily developed areas of this region are typically warmer than surrounding suburban and rural areas due to the amount of asphalt, brick, and concrete. The northern edge of the Central Region is often the boundary between freezing and non-freezing precipitation during the winter months. Areas in the southern part of this region tend to have nearly twice as many days with temperatures above 90°F than other locations in the central portion of the State (ONJSC Rutgers University n.d.).

Figure 4.3.6-3. Climate Regions of New Jersey



Source: ONJSC Rutgers University, Date Unknown

Note: The black circle indicates the location of Passaic County. The County is located in the North and Central Climate Zones of New Jersey.

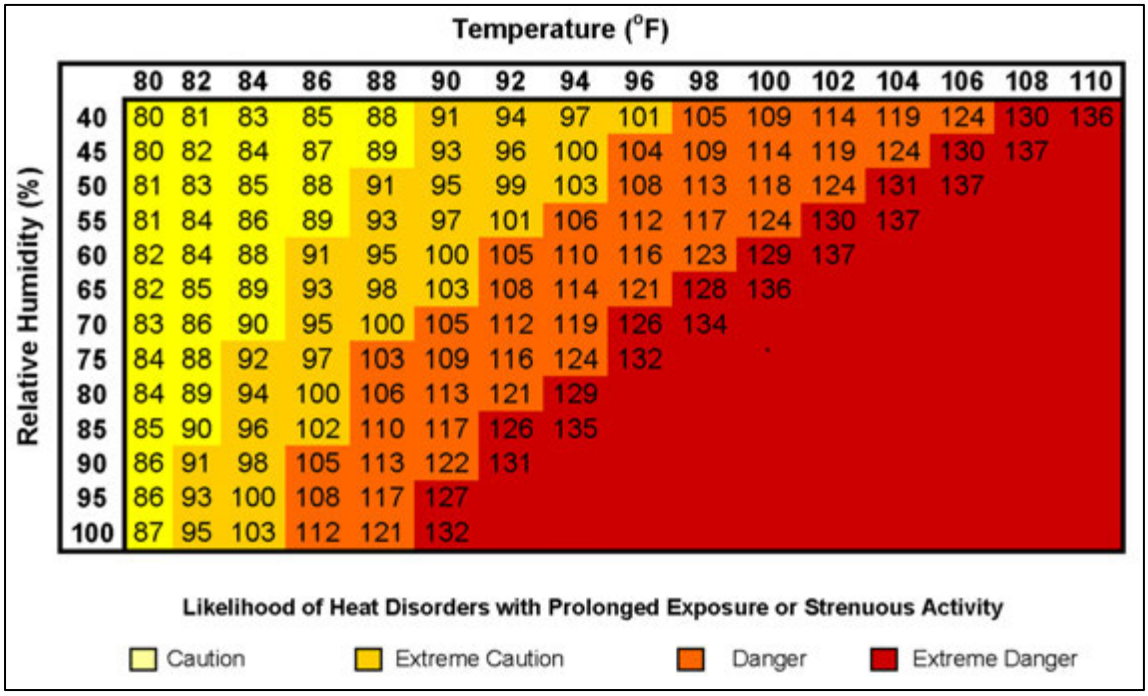
Extent

Extreme Heat

NOAA's heat alert procedures are based mainly on Heat Index values. The Heat Index is given in degrees Fahrenheit. The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the

actual air temperature. To find the Heat Index temperature, the temperature and relative humidity need to be known. Once both values are known, the Heat Index will be the corresponding number with both values (Figure 4.3.6-1 and Figure 4.3.6-2). The Heat Index indicated the temperature the body feels. It is important to know that the Heat Index values are devised for shady, light wind conditions. Exposure to full sunshine can increase heat index values by up to 15°F. Strong winds, particularly with very hot dry air, can also be extremely hazardous (NWS 2013).

Figure 4.3.6-4. NWS Heat Index Chart



Source: *NWS 2013*
°F *degrees Fahrenheit*
% *percent*

Figure 4.3.6-5. Adverse Effects of Prolonged Exposures to Heat on Individuals

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke / Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

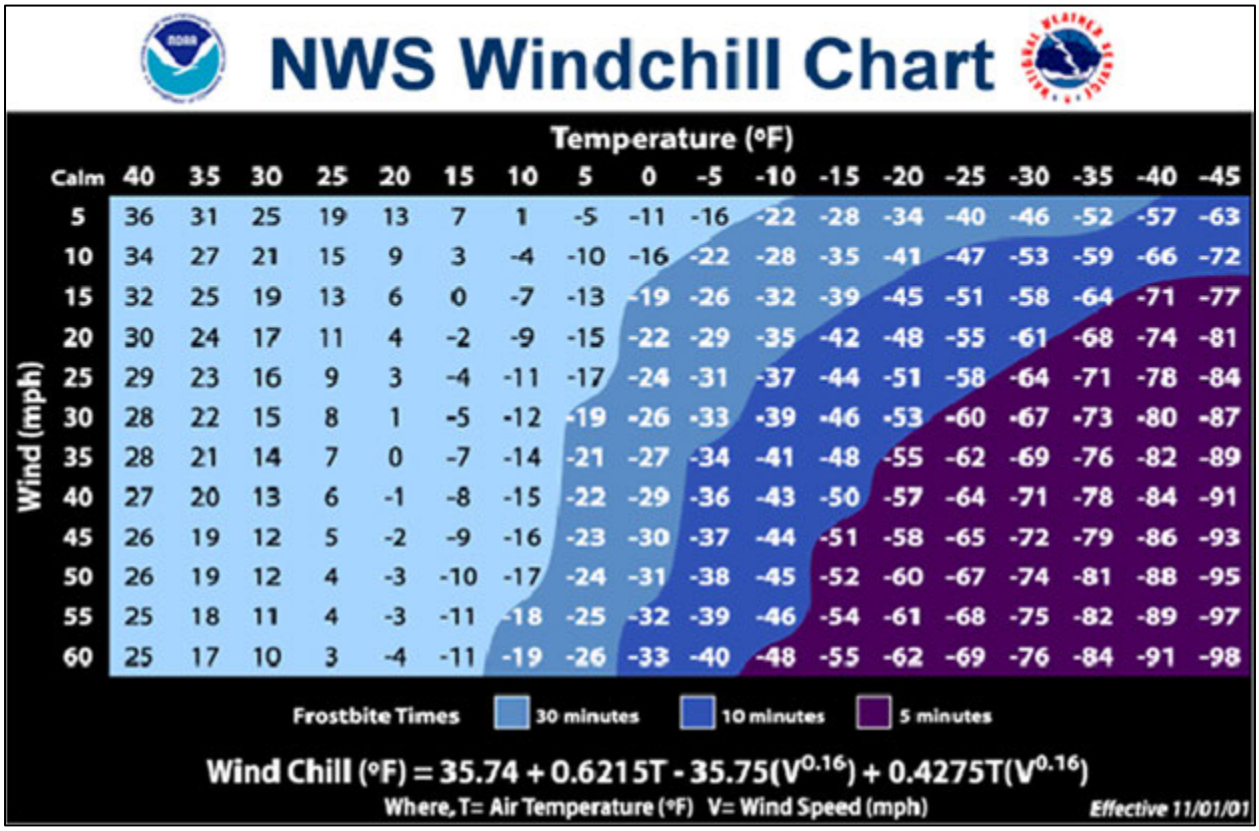
Source: *NWS 2009*
°F *degrees Fahrenheit*

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures are generally measured through the Wind Chill Temperature (WCT) Index. Wind Chill Temperature is the temperature that people and animals feel when outside and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin's temperature to drop (NWS Date Unknown).

On November 1, 2001, the NWS implemented a new WCT Index. It was designed to more accurately calculate how cold air feels on human skin. The table below shows the new WCT Index. The WCT Index includes a frostbite indicator, showing points where temperature, wind speed, and exposure time will produce frostbite to humans. Figure 4.3.6-3 shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops (NWS Date Unknown).

Figure 4.3.6-6. NWS Wind Chill Index



Source: NWS 2009b
°F degrees Fahrenheit
mph miles per hour

Warning Time

Meteorologists can accurately forecast extreme temperature event development and the severity of the associated conditions with several days lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations. For heat events, the NWS issues excessive heat outlooks when the potential exists for an excessive heat event in the next three to seven days. Watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. Excessive heat warning/advisories are issued when an excessive heat event is expected in the next 36 hours (NWS 2013). Winter temperatures may fall to extreme cold readings with no wind occurring. Currently, the only way to headline very cold temperatures is with the use of the NWS-designated Wind Chill Advisory or Warning products. When actual temperatures reach Wind Chill Warning criteria with little to no wind, extreme cold warnings may be issued (NOAA 2013).

Previous Occurrences and Losses

New Jersey has been experiencing an increase in extreme temperatures across the State. The number of very hot days has been above average since the early 2000's. However, declines in the number of extreme cold days have occurred since the early 1990's (NOAA NCEI 2019).

FEMA Major Disasters and Emergency Declarations

Between 1954 and March 15, 2019, neither Passaic County nor the State of New Jersey were included in any major disaster (DR) or emergency (EM) declarations due to extreme temperatures. However, during the same time period, the Federal Emergency Management Agency (FEMA) included Passaic County in two winter storm-related DR or EM declarations classified as one or a combination of the following disaster types that may have had associated extreme cold temperatures: severe winter storm, snowstorm, snow, ice storm, winter storm, and blizzard (Table 4.3.6-1).

Table 4.3.6-1. Winter Weather Related Disaster (DR) and Emergency (EM) Declarations 1954-2019

Declaration	Event Date	Declaration Date	Event Description
DR-1954	December 26-27-2010	February 4, 2011	Snow: Severe Winter Storm and Snowstorm
DR-4368	March 6-7, 2018	June 8, 2018	Severe Storm(s): Severe Winter Storm and Snowstorm

Source: FEMA 2020

Agriculture-related drought disasters are quite common. One-half to two-thirds of the counties in the U.S. have been designated as disaster areas in each of the past several years. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2012 and 2019, New Jersey has been included in seven USDA declarations. Of those seven declarations, Passaic County has been included in the following six declarations as outlined in Table 4.3.6-2.

Table 4.3.6-2. Extreme Temperature-related USDA Disaster Declarations 2012-2019 for Passaic County

Declaration	Event Date	Declaration Date	Event Description
S3930	April 1, 2015 – September 29, 2015	November 4, 2015	Excessive Heat and Drought
S3759	August 15, 2014 – Continuing	October 1, 2014	Drought
S3249	March 1, 2012 – Continuing	June 5, 2012	Frost / Freeze
S3251	March 26, 2012 – April 8, 2012	June 5, 2012	Frost / Freeze
S3427	June 2, 2012 – Continuing	October 24, 2012	Drought, Heat, Excessive Heat, High Temperatures
S3487	June 28, 2012 – November 2012	February 14, 2013	Drought, Heat, Excessive Heat, High Temperatures

Source: USDA 2020

Extreme Temperature Events

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events database records and defines extreme temperature events as follows:

- Cold/Wind Chill is reported in the NOAA-NCEI database when a period of low temperatures or wind chill temperatures reach or exceed locally or regionally defined advisory conditions (typical value is -18 °F or colder).
- Excessive Heat is reported in the NOAA-NCEI database whenever heat index values meet or exceed locally or regionally established excessive heat warning thresholds.
- Extreme Cold/Wind Chill is reported in the NOAA-NCEI database when a period of extremely low temperatures or wind chill temperatures reaches or exceeds locally or regionally defined warning criteria (typical value around -35 °F or colder).
- Heat is reported in the NOAA-NCEI database whenever heat index values meet or exceed locally or regionally established advisory thresholds.

Extreme temperature events that have impacted Passaic County between 2014 and 2019 are identified in Table 4.3.6-3. Please see Section 9 (Jurisdictional Annexes) for available information regarding impacts and losses to each municipality, where available.

Table 4.3.6-2. Extreme Temperature Events in Passaic County, 2014 to 2019

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
July 22, 2019	Hail	N/A	N/A	A cold front stalled as a stationary boundary triggering severe thunderstorms that impacted Northeastern New Jersey.
March 15, 2019	Hail	N/A	N/A	A cold front moved through the region triggering strong to severe thunderstorms across Northeast New Jersey.
March 3, 2019	Heavy Snow	N/A	N/A	Low pressure developed across the southeast on Sunday March 3, 2019 and then tracked off the Middle Atlantic coast early on Monday March 4, 2019. The low moved just inside the 40N/70W benchmark and continued out to sea. The low brought a widespread snowfall to northeast New Jersey with the heaviest accumulations occurring across the interior.
February 17, 2018	Heavy Snow	N/A	N/A	This system brought heavy snow to northern portions of northeast New Jersey.
March 14, 2017	Blizzard	N/A	N/A	Rapidly deepening low pressure tracked up the eastern seaboard bringing blizzard conditions to Western Passaic county. Heavy snow and sleet along with strong winds occurred across the rest of Northeast New Jersey.
February 1, 2015	Heavy Snow	N/A	N/A	n area of low pressure tracked east from the Ohio Valley the night of February 1 to just south of Long Island the afternoon of February 2. The proximity of the low with arctic air to the north resulted in snow at the onset, which transitioned to a wintry mix during the morning hours before going back to snow by early afternoon. Northeast New Jersey received 5 to 12 inches of snowfall and up to a third of an inch of ice.
January 24, 2015	Heavy Snow	N/A	N/A	Low pressure moved out of the northern Gulf of Mexico on the morning of the 23rd, to the Mid Atlantic coast on the morning of the 24th, then rapidly intensified on its way northeast to the Canadian Maritimes the following day. This low brought heavy snow to parts of northeast New Jersey on the 24th.
July 3, 2014	Hail	N/A	N/A	As a cold front slowly moved across the area, moisture from Tropical Cyclone Arthur passing to the south and east converged along the boundary resulting in severe thunderstorms, heavy rain and flash flooding in portions of Northeast New Jersey.
November 26, 2014	Heavy Snow	N/A	N/A	Low pressure developed during the late evening hours on November 25th across northern Florida, and quickly raced along the Eastern seaboard on the 26th, bringing heavy snow along and northwest of the Interstate 287 corridor of interior Northeast New Jersey, and disrupting travel plans the day before Thanksgiving Day.
February 5, 2014	Heavy Snow	N/A	N/A	A complex low-pressure system moving through the Ohio Valley and Mid Atlantic regions brought a quick burst of moderate to heavy snow, sleet, and freezing rain to Northeast New Jersey the morning of February fifth.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
February 3, 2014	Heavy Snow	N/A	N/A	Weak low pressure passing to the south brought heavy snow to Northeast New Jersey on the third.
January 21, 2014	Heavy Snow	N/A	N/A	Low pressure moving from the central Appalachians the morning of the 21st intensified off the Mid Atlantic coast and brought heavy snow to most of northeast New Jersey.
January 2, 2014	Heavy Snow	N/A	N/A	A low-pressure system moving into the Ohio Valley on January 2 redeveloped and intensified along the Mid Atlantic coast, bringing heavy snow to Northeast New Jersey before moving out to sea on the third of January.

Source: NOAA-NCEI 2020; NWS 2020

°F degrees Fahrenheit

N/A Not applicable

Note: With documentation for New Jersey and Passaic County being so extensive, not all sources have been identified or researched; therefore, Table 4.3.5-2 may not include all events that have occurred or impacted the County.

Probability of Future Occurrences

It is anticipated that Passaic County will continue to experience extreme temperatures annually that may coincide with or induce secondary hazards such as snow, hail, ice or windstorms, thunderstorms, drought, human health impacts, and utility failures. Table 4.3.6-3 shows the annual number of events, recurrence interval, annual probability, and annual percent chance of occurrence for the hazards associated with extreme temperatures and reported in the NOAA-NCEI Storm Events Database.

Based on these historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for extreme temperatures in Passaic County is considered "frequent". Refer to Section 4.4 (Hazard Ranking) for more information.

Table 4.3.6-3. Probability of Occurrences of Extreme Temperature Events

Hazard Type	Number of Occurrences Between 1950 and April 2019	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	Percent (%) Chance of Occurring in Any Given Year
Cold/Wind Chill	1	0.01	70.0	0.01	1.43
Excessive Heat	4	0.06	17.5	0.06	5.71
Extreme Cold/Wind Chill	3	0.04	23.3	0.04	4.29
Heat	5	0.07	14.0	0.07	7.14
Total	**13**	**0.19**	**5.4**	**0.19**	**18.57**

Source: NOAA-NCEI 2020

Note: Probability was calculated using the available data provided in the NOAA-NCEI storm events database. Due to limitations in data, not all extreme temperature events occurring between 1950 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is under-estimated.

Potential Effects of Climate Change

Providing projections of future climate change for a specific region is challenging. Shorter term projections are more closely tied to existing trends making longer term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes.

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2019). Most of this warming has occurred since 1970. The State of New Jersey, for example, has observed an increase in average annual temperatures of 1.2°F between the period of 1971-2000 and the most recent decade of 2001-2010 (CATF 2013). Winter temperatures across the Northeast have seen an increase in average temperature of 4°F since 1970 (Northeast Climate Impacts Assessment [NECIA] 2007). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2013). According to a recent state-level analysis, by the middle of the 21st century an estimated 70 percent of summers in this region are anticipated to be hotter than what we now recognize as the warmest summer on record (NOAA NCEI 2019).

4.3.6.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable. The entire County is considered vulnerable to extreme temperature events, which is discussed in a qualitative nature in the following section.

Impact on Life, Health and Safety

The entire population of Passaic County is exposed to extreme temperature events: population of 510,562 people, according to the 2013-2017 American Community Survey population estimates. Extreme temperature events have potential health impacts including injury and death. According to the Centers for Disease Control and Prevention, populations most at risk to extreme cold and heat events include the following: 1) the elderly, who are less able to withstand extreme temperatures due to their age, health conditions and limited mobility to access shelters; 2) infants and children up to four years of age; 3) individuals with chronic medical conditions (e.g., heart disease or high blood pressure); 4) low-income persons that cannot afford proper heating and cooling; and 5) the general public who may overexert during work or exercise during extreme heat events or experience hypothermia during extreme cold events (CDC 2016).

There are 69,429 persons over 65 years old, 38,842 persons under 5 years old, and 86,667 persons below the poverty level out of the total 510,562 persons that live in Passaic County (ACS 2017). Higher concentrations of persons over 65 years in age reside in the Borough of North Haledon (i.e., 24.2% of total population) and higher concentrations of persons below the poverty level reside in the City of Passaic (i.e., 33% of total population). Refer to Section 3 (County Profile) which summarizes the density of these populations throughout the County.

Risk of structural fire in the winter months is elevated with approximately 30 percent of all deaths caused by fire occurring in the winter months. Cooking and heat sources too close to combustible materials are leading factors in winter home fires (U.S. Fire Administration 2018). Often times, power outages occur during extreme cold events. Individuals powering their homes with generators are subjected to carbon monoxide poisoning if proper ventilation procedures are not followed. Improperly connected portable generators are capable of 'back feeding' power lines which may cause injury or death to utility works attempting to restore power and may damage house wiring and/or generators (NJOEM 2019).

Meteorologists can accurately forecast extreme heat and cold event development and the severity of the associated conditions with several days of lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations, implement short-term emergency response actions, and focus on surveillance and relief efforts on those at greatest risk. Adhering to extreme temperature warnings can significantly reduce the risk of temperature-related deaths.

Impact on General Building Stock

All buildings are exposed to the extreme temperature hazard. Extreme heat generally does not impact buildings; however, elevated summer temperatures increase the energy demand for cooling. Losses can be associated with the overheating of heating, ventilation, and air conditioning (HVAC) systems. Extreme cold temperature events can damage buildings through freezing/bursting pipes and freeze/thaw cycles, as well as increasing vulnerability to home fires. Additionally, manufactured homes (mobile homes) and antiquated or poorly constructed facilities can have inadequate capabilities to withstand extreme temperatures.

Impact on Critical Facilities

All critical facilities in the County are exposed to the extreme temperature hazard with similar risks as discussed for the general building stock. It is essential that critical facilities remain operational during natural hazard

events. Extreme heat events can sometimes cause short periods of utility failures, commonly referred to as "brown-outs", due to increased usage from air conditioners, appliances, etc. Similarly, heavy snowfall and ice storms, associated with extreme cold temperature events, can cause power interruption as well. Backup power is recommended for critical facilities and infrastructure. Where backup power is needed for critical facilities that provide essential services, municipalities identified mitigation actions in Section 9 (Jurisdictional Annexes).

In 2019, the North Jersey Transportation Planning Authority (NJTPA) released a report for the Passaic River Basin that discusses climate change including extreme heat and impacts to transportation infrastructure. Impacts associated with extreme heat events on bridges, culverts, facilities, rail, roads and mass transit include stress, sagging, thermal expansion and system failure. The NJTPA study assessed the level of vulnerability (as measured by criticality, sensitivity and adaptive capacity) of transportation assets in the Passaic River Basin which includes portions of Passaic County (NJTPA 2019).

Impact on Economy

Extreme temperature events also have impacts on the economy, including loss of business function and damages to inventory. Business-owners may be faced with increased financial burdens due to unexpected repairs caused to the building (e.g., pipes bursting), higher than normal utility bills (e.g., less efficient heating or cooling systems overexerting power based on temperature extremes) or business interruption due to power failure (i.e., loss of electricity, telecommunications). In general, the agricultural industry is most at risk in terms of economic impact and damage due to extreme temperature events. Extreme heat events can result in drought and dry conditions and directly impact livestock and crop production. More information about the impacts of drought on the agricultural industry is discussed in Section 4.3.4 (Drought).

Impact on the Environment

Extreme weather events can have a major impact on the environment. For example, freezing and warming weather patterns create changes in natural processes. An excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (USGS nd). Likewise, rain-on-snow events also exacerbate runoff rates with warming winter weather.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

The ability of new development to withstand extreme temperature impacts lies in sound land use practices, building design considerations (e.g. Leadership in Energy and Environmental Design [LEED]), and consistent enforcement of codes and regulations for new construction. New development will change the landscape where buildings, roads, and other infrastructure potentially replace open land and vegetation. Surfaces that were once permeable and moist are now impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas forming (heat islands as described above). Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

Municipalities that experience increases in population may require utility system upgrades to keep up with utility demands (e.g., water, electric) during extreme temperature events to prevent increased stresses on these systems. NJTPA includes high population growth forecasts as one criterion to prioritize transportation adaptation strategies. Refer to Section 3 (County Profile) for a detailed discussion on population change in Passaic County.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures. Changes in the climate could alter the frequency of extreme temperature events that occur in the County, resulting in even hotter or colder events. As a result, vulnerable populations could be at risk for experiencing a greater number of illnesses associated with extreme temperature events, such as heatstroke and cardiovascular and kidney disease. Additionally, if temperatures become more extreme, a greater number of buildings, facilities, and infrastructure systems may exceed their ability to cope with these extremes.

Vulnerability Change Since the 2015 HMP

Overall, the entire County remains vulnerable to extreme temperatures. As existing development and infrastructure continue to age, they can be at increased risk to failed utility and transportation systems if they are not properly maintained and do not adapt to the changing environment.

4.3.7 Flood

The following section provides the hazard profile and vulnerability assessment for the flood hazard, including riverine, flash, urban/stormwater and sea level rise, in Passaic County.

2020 HMP Changes

- For the 2020 HMP update, the flood profile includes riverine, flash, sea level rise and urban flooding. Coastal storm surge is discussed in Section 4.3.1 (Coastal Storm) and dam failure is discussed in Section 4.3.3 (Dam Failure). In the previous 2015 Passaic County HMP, only riverine/flash flooding and sea level rise were included.
- The hazard profile has been updated using best available data with events that occurred between 2015 and 2020.
- The 2020 effective FIRM was used to evaluate the County's exposure and vulnerability to flooding. The HAZUS-MH v4.2 flood model was used to estimate potential losses to the general building stock and critical facilities. An updated building stock inventory was developed using 2019 RS Means data to generate replacement cost values in substitute of the 2013 appraised improvement value.
- The data from the NJTPA Passaic River Basin Climate Study were integrated.

4.3.7.1 Profile

Hazard Description

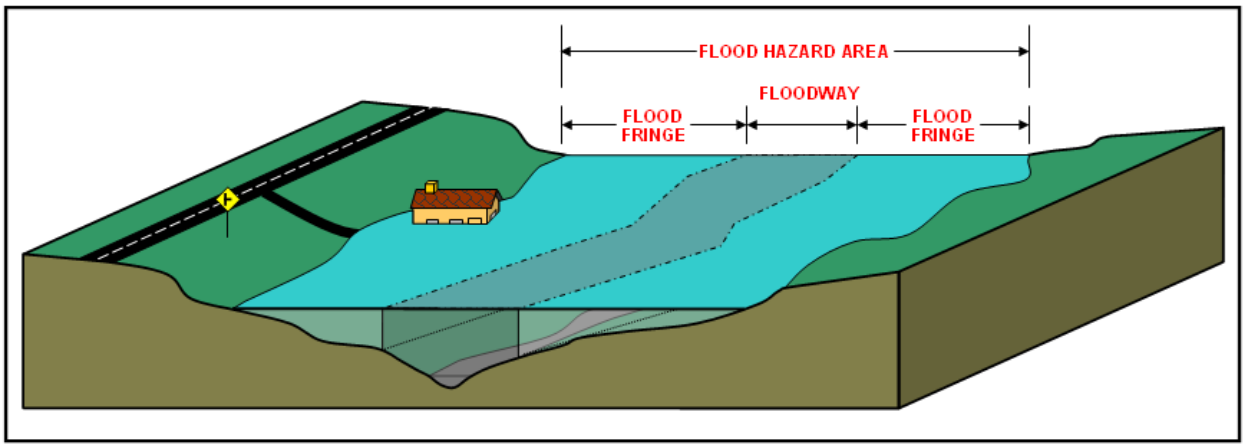
A flood is the inundation of normally dry land resulting from the rising and overflowing of a body of water. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (FEMA 2020). Floods are frequent and costly natural hazards in New Jersey in terms of human hardship and economic loss, particularly to communities that lie within flood-prone areas or floodplains of a major water source.

For the purpose of this HMP update, the flood hazard for Passaic County includes riverine (inland) flooding, flash flooding, urban/stormwater flooding and sea level rise. Coastal storm surge is discussed in Section 4.3.1 (Coastal Storm) and dam failure is discussed in Section 4.3.3 (Dam Failure).

Riverine (Inland) Flooding

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. In Passaic County, floodplains line the rivers and streams of the County. The boundaries of the floodplains are altered as a result of changes in land use, the amount of impervious surface, placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques. Figure 4.3.7-1 depicts the flood hazard area, the flood fringe, and the floodway areas of a floodplain.

Figure 4.3.7-1. Floodplain



Source: New Jersey Department of Environmental Protection (NJDEP) Date Unknown

Flash Flooding

Flash floods are "a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters" (National Weather Service [NWS] 2009).

Urban/Stormwater Flooding

Heavy rainfall that overwhelms a developed area's stormwater infrastructure causing flooding is commonly referred to as urban flooding. Urban flooding can be exacerbated by aging and inadequate infrastructure and over development. The growing number of extreme rainfall events that produce intense precipitation are resulting in increased urban flooding (Center for Disaster Resilience 2016). While riverine and coastal flooding is mapped and studied by FEMA, urban flooding is not.

NOAA defines urban flooding as the flooding of streets, underpasses, low lying areas, or storm drains (NOAA 2009). Urban drainage flooding is caused by increased water runoff due to urban development and inadequate drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and other urban areas. The systems make use of a closed conveyance system that channels water away from an urban area to surrounding streams. This bypasses the natural processes of water filtration through the ground, containment, and evaporation of excess water. Because drainage systems reduce the amount of time the surface water takes to reach surrounding streams, flooding in those streams can occur more quickly and reach greater depths than prior to development in that area (Harris 2008).

High groundwater levels can be a concern and cause problems even where there is no surface flooding. Basements are susceptible to high groundwater levels. Seasonally high groundwater is common in many areas, while elsewhere high groundwater occurs only after a long period of above-average precipitation (FEMA 1997).

Sea Level Rise

Evidence supports that global sea level is rising at an increased rate and will continue rising over the next century. The two major causes of sea level rise are thermal expansion, caused by the warming of the oceans, and the loss of land-based ice (glaciers and polar ice caps), due to increased melting. Thermal expansion can account for

50% of sea level rise and is a result of warming atmospheric temperatures and subsequent warming of ocean waters causing the expansion. Since 1900, records and research have shown that sea level has been steadily rising at a rate of 0.04 to 0.1 inches per year (NOAA 2013).

Sea-level rise in New Jersey has resulted in an increase in sea level of roughly 16 inches in the past century. The rate of sea-level rise is anticipated to increase over time, with the rate of increase being tied to the rate of greenhouse gas emissions and the corresponding increase in global temperatures (Rutgers 2016). As sea levels continue to rise, an increase in the frequency and severity of coastal flooding events from coastal storms is expected. Rising sea levels can result in permanent inundation of land that is currently above the high tide line, increase flooding risk from coastal storms, increase erosional rates, reduce the effectiveness of infrastructure, such as stormwater systems, and damage or destroy critical habitats.

Location

Flooding potential is influenced by climatology, meteorology and topography. Extensive development, such as that seen in many areas of Passaic County, can also impact flooding potential as it leaves fewer natural surfaces available to absorb rainwater, forcing water directly into streams, rivers, and existing drainage systems swelling them more than when more natural surface buffered the runoff rate.

Passaic County is bordered to the south by the Pompton and Pequannock Rivers, which creates the border between Passaic and Morris Counties. In the southeastern portion of the County, the Passaic River forms the border between Passaic and Bergen Counties. Numerous areas in the County are susceptible to localized flooding from excessive rain events, stormwater runoff, urban flooding, local drainage problems, overbank flooding, and other sources. All municipalities in the County have experienced flooding to some degree (Passaic County HMP 2015).

The urban areas of Passaic County are vulnerable to severe flooding and flood-related damages. Low-lying areas throughout the County are subject to periodic flooding caused by the overflow of streams. Flooding from the Passaic River affects the Boroughs of Bloomingdale, Prospect Park, Totowa, Woodland Park, and Hawthorne, the Townships of Little Falls and Wayne, and the Cities of Clifton, Passaic, and Paterson. This is due to the establishment of highly developed areas adjacent to the Passaic River. Flooding from Molly Ann Brook affects the communities of Haledon, North Haledon, Paterson, and Prospect Park. Flooding from the Pequannock River affects low-lying areas of Bloomingdale and Pompton Lakes. Flooding from the Wanaque River affects Pompton Lakes, Ringwood, and Wanaque. Additionally, the smaller tributaries in the County also cause flooding in several municipalities (FEMA FIS 2020).

Floodplains

The Digital Flood Insurance Rate Map (DFIRM) data provided by FEMA for Passaic County show the following flood hazard areas:

- 1-Percent Annual Chance Flood Hazard: Areas subject to inundation by the 1-percent-annual-chance flood event. This is also referred to as the Special Flood Hazard Area (SFHA). Mandatory flood insurance requirements and floodplain management standards apply.
- 0.2-Percent Annual Chance Flood Hazard: Area of minimal flood hazard, usually depicted on FIRMs as the 500-year flood level or Shaded X Zone.

The latest floodplain maps for Passaic County are effective April 17, 2020 FEMA. Locations of flood zones as depicted on the FEMA effective Digital Flood Insurance Rate Map (DFIRM) are illustrated in Figure 4.3.7-2. The total land area comparing the 2007 FEMA DFIRM to the updated 2020 DFIRM is summarized in Table 4.3.7-1. Refer to Section 9 for a map of each jurisdiction depicting the floodplains. Overall, there have been

changes in floodplain area in many of the municipalities. Although changes in floodplain area may appear to be small, changes in the floodway area have also occurred and may be larger. The floodway has higher/stricter NJDEP standards including restrictions on development.

Table 4.3.7-1. Changes in Land Area in the 1-Percent and 0.2-Percent Annual Chance Flood Zones (Acres) – 2007 FEMA DFIRMs and 2020 FEMA DFIRMs

Municipality	Total Municipal Area (acres)	2007 FEMA DFIRM (acres)		2020 FEMA DFIRM (acres)		Change in Floodplain Area (acres)	
		1-Percent Annual Chance	0.2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Bloomingdale, Borough of	5,916.99	551.24	570.56	462.68	492.24	-88.56	-78.32
Clifton, City of	7,313.72	288.65	465.97	240.58	351.12	-48.07	-114.85
Haledon, Borough of	778.50	15.31	38.42	15.43	37.89	0.12	-0.53
Hawthorne, Borough of	2,152.61	153.11	251.39	147.61	245.26	-5.50	-6.13
Little Falls, Township of	1,841.49	310.57	395.09	327.41	417.67	16.84	22.58
North Haledon, Borough of	2,257.10	83.96	106.49	95.16	122.16	11.20	15.67
Passaic, City of	2,073.06	202.41	313.08	196.27	292.90	-6.14	-20.18
Paterson, City of	5,563.16	539.07	913.61	562.06	782.80	22.99	-130.81
Pompton Lakes, Borough of	2,000.31	654.36	777.25	675.81	765.54	21.45	-11.71
Prospect Park, Borough of	300.75	4.72	8.38	3.41	6.98	-1.31	-1.40
Ringwood, Borough of	18,230.46	2,440.34	2,646.85	2,476.66	2,655.48	36.32	8.63
Totowa, Borough of	2,610.52	248.84	412.12	244.20	405.74	-4.64	-6.38
Wanaque, Borough of	5,967.63	1,215.79	1,410.68	1,261.48	1,467.86	45.69	57.18
Wayne, Township of	16,108.09	3,687.08	4,049.09	3,547.04	3,947.53	-140.04	-101.56
West Milford, Township of	51,848.21	5,232.26	7,549.17	5,182.84	7,514.34	-49.42	-34.83
Woodland Park, Borough of	1,965.48	293.98	383.88	329.48	392.67	35.50	8.79
Passaic County (Total)	**126,928.08**	**15,921.68**	**20,292.02**	**15,768.12**	**19,898.20**	**-153.56**	**-393.82**

Source: FEMA 2007; 2020
The area presented includes the total area of the County, which may include waterways.

Floodprone Areas in Passaic County

Passaic River Basin

The Passaic River Basin is one of the most densely developed floodplains in the eastern U.S. It has a population density of 8,656 people per square mile with 2.5 million residents (50,000 living in the floodplain) and approximately 20,000 homes, businesses, and public buildings. The main stem of the Passaic River and its major tributaries have a 1% annual chance flood area that covers 60 square miles. This amounts to a drainage area of 1,134 square miles which receives an average of 50.08 inches of rain each year (Passaic County 2013).

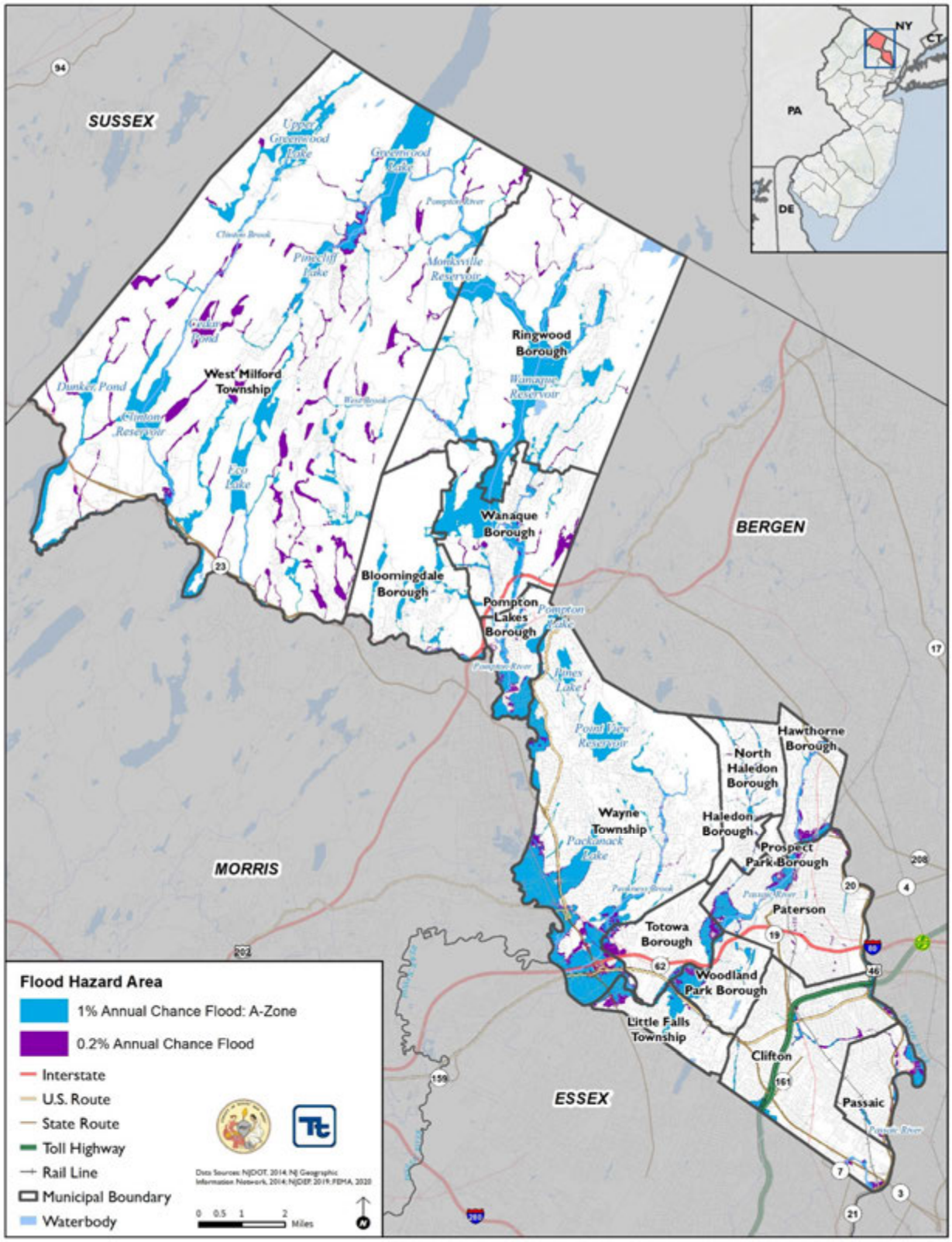
Flooding has been a longtime problem in the Passaic River Basin. Since colonial times, floods have claimed lives and damaged property in the basin. The growth of residential and industrial development in recent years has significantly increased the threat of serious damages and loss of life from flooding. Since 1990, at least 26 lives have been lost in floods and total losses from flooding events are over $6 billion ($261 million for Hurricane Floyd in 1999 and $1 billion for Hurricane Irene in August 2011). In addition to the flood damage in over 35 municipalities in the basin, there has also been extensive environmental damage from flooding. Significant

interruption to businesses and transportation has also resulted in hardship in the basin and region after each flood event. Since 1968, the Passaic River Basin has experienced 15 federal disaster declarations, 6 of which occurring since 2005 (USGS 2014; Passaic County Future 2013).

The source of the Passaic River begins near the Borough of Mendham (Morris County) where small streams come together to form a brook. The river continues through open farmland and eventually winds through seven counties, 45 municipalities, and finally into Newark Bay. At its source, the river is approximately 600 feet above sea level and flows for approximately 90 miles. The river's southeasterly flow goes south of Jockey Hollow at Morristown National Historical Park and becomes the boundary between Somerset and Morris Counties, east of Bernardsville and Basking Ridge and southwest of the Great Swamp National Wildlife Refuge (Passaic County HMP 2015).

When the Passaic River reaches Passaic County, it passes through Two Bridges where it takes a slow, easterly course to Little Falls. The river then continues northeast to the Great Falls in Paterson. At Great Falls, the Passaic River passes over a 70-foot rocky ledge, eventually flowing down to Paterson. The river continues north, reversing itself at Hawthorne where it flows about 25 miles to Newark Bay. At Hawthorne, the river becomes dammed, creating Dundee Lake. Below the dam at Garfield, the Saddle River joins the Passaic River and flows through heavily industrialized and residential areas of Bergen, Hudson, and Essex Counties. At Harrison (Passaic County), it makes an s-curve northeast and then turns southeast and meets up with the Hackensack River as it empties into the Newark Bay (Passaic County HMP 2015).

Figure 4.3.7-2. FEMA Flood Hazard Areas in Passaic County (Effective 2020 FIRM)



Molly Ann Brook and Watershed

Molly Ann Brook is a tributary of the Passaic River and flows south between the northern ranges of First Watchung Mountain and Second Watchung Mountain in Passaic and Bergen Counties. Traveling north from its confluence with the Passaic River, Molly Ann Brook passes through the City of Paterson and the Boroughs of Haledon, Prospect Park, North Haledon and Franklin Lakes.

The Molly Ann Brook Watershed is a 7.8 square mile area within the Passaic River Basin. It includes the main stem of the Molly Ann Brooke and all named (Falls Brook, Squaw Brook and Glenn Place Brooke) and un-named tributaries as well as all named (Haledon Reservoir and Oldham Pond) and un-named surface waterbodies. It is located in Passaic and Bergen County, New Jersey and includes all of North Haledon and Haledon Boroughs and parts of Wayne and Wyckoff Townships and Prospect Park, Totowa, Franklin Lakes Boroughs and the City of Paterson (Molly Ann Brook Watershed Management Plan 2008).

Flooding from Molly Ann Brook affects the communities of Haledon, North Haledon, Paterson, and Prospect Park. Presently, the USACE is undertaking a long-term flood control project along Molly Ann Brook in the City of Paterson and Borough of Haledon. This project involves channel improvements, bridge modifications or replacements, and the removal of one structure (a warehouse) (FEMA FIS 2020).

Wanaque River

The Wanaque River is a tributary of the Pequannock River. It is located approximately 1,113 feet downstream of Corning Avenue and approximately 88 feet upstream of County Route 511. Its source is from Greenwood Lake in the village of Greenwood Lake. From the Raymond Dam of the Wanaque Reservoir, the river flows to its confluence with the Pequannock River (FEMA FIS 2020).

Flooding from the Wanaque River affects the communities of Pompton Lakes, Ringwood, and Wanaque (FEMA FIS 2020).

Pompton River

The Pompton River is the main tributary by volume to the Passaic River and is approximately 8 miles long with a drainage area of 355 square miles. It starts south of the Borough o Pompton Lakes by the confluence of the Ramapo and Pequannock Rivers and flows south between Lincoln Park and Pequannock Township and Wayne. Its watershed encompasses a portion of the Ramapo Mountains along the New York – New Jersey border. A portion of the river is diverted to the nearby Wanaque Reservoir. Flooding from the Pompton River affects the Township of Wayne (FEMA FIS 2020).

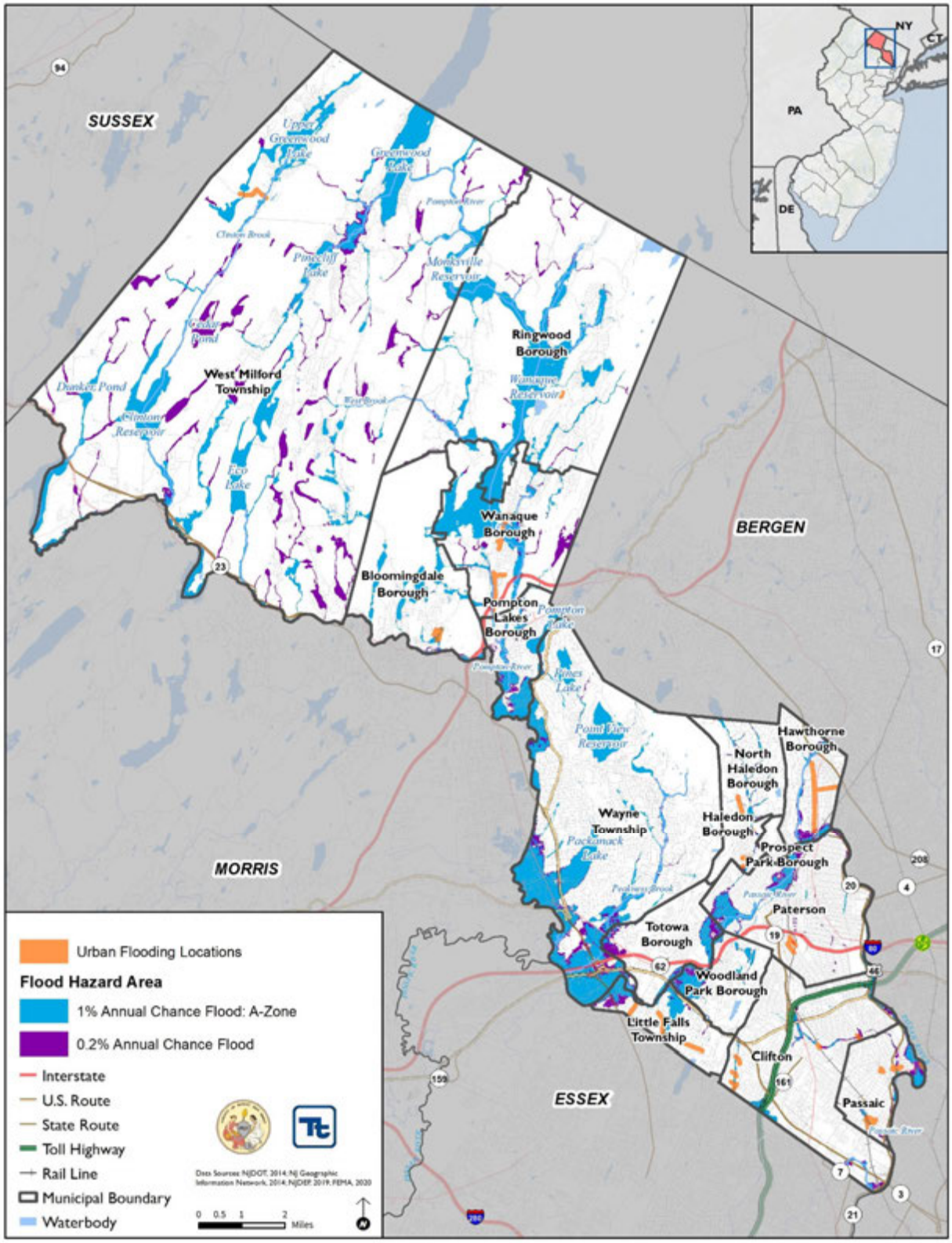
Flood Risk Products

In September 2018, FEMA released Flood Risk Products that included Passaic County. Flood Risk Products have purposes different from regulatory flood hazard products serving as a supplemental resource communicating flood risk to communities that may not entirely align with the regulatory flood maps. A Flood Risk Report was generated for the Hackensack-Passaic Watershed which includes municipalities in Passaic County. This report along with multi-frequency flood depth grids may be found on the FEMA Map Service Center website.

Urban Flooding

Throughout Passaic County, low-lying surface flooding and interior shallow ponding occurs as a result of heavy rainfall and inadequate capacity of stormwater systems. While riverine flooding is mapped by FEMA, urban flooding is not. Each municipality was asked to identify areas that flood outside the FEMA-mapped floodplain in an attempt to identify problem areas and assist with identifying mitigation solutions. Figure 4.3.7-3 illustrates the urban flood areas identified by the municipalities participating in the 2020 HMP update.

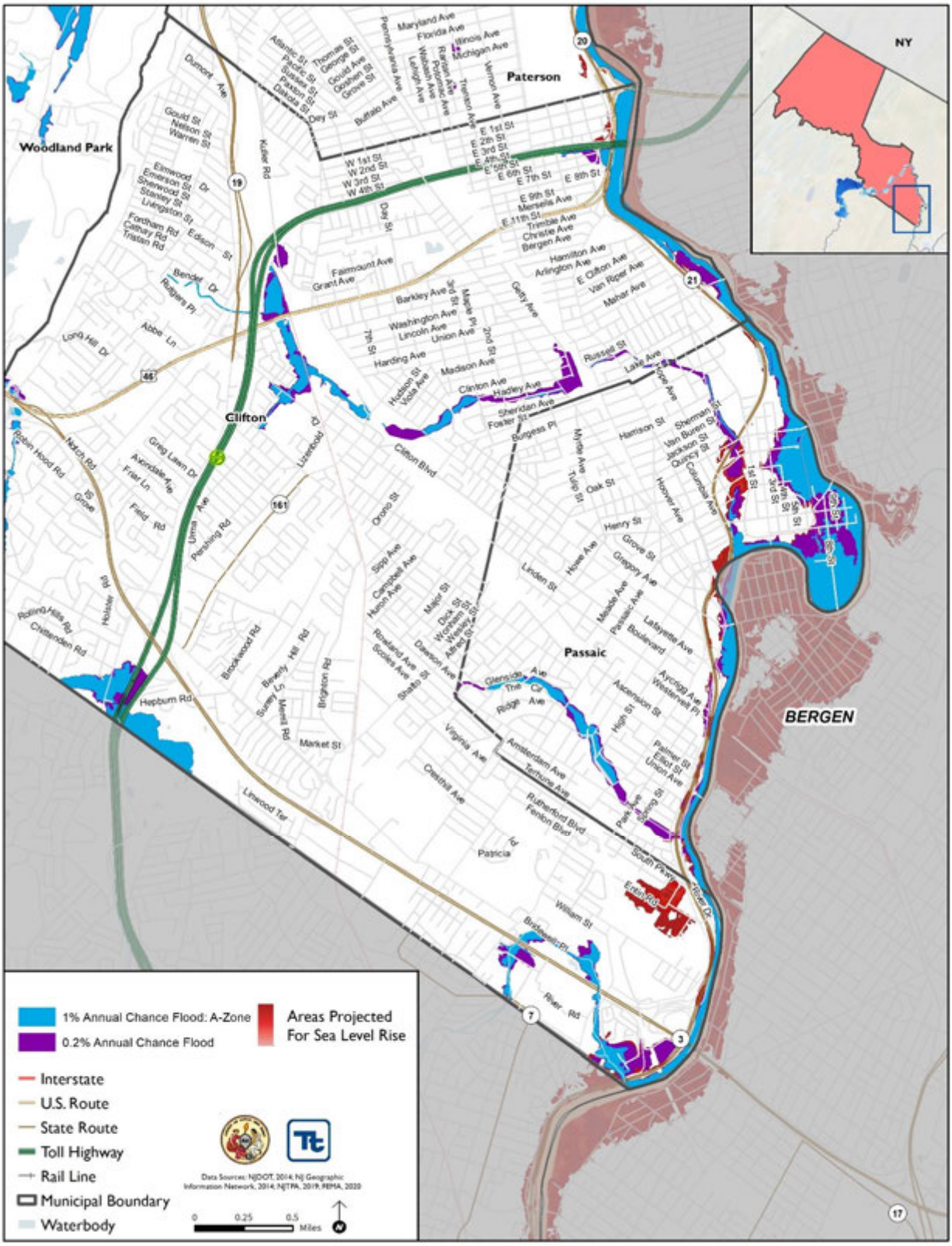
Figure 4.3.7-3. Urban Flood Areas Identified in Passaic County



Sea Level Rise

The North Jersey Transportation Planning Authority (NJTPA) recently completed the Passaic River Basin Climate Resilience Planning Study (2019) which assessed the potential for increasingly severe and frequent storm and heat events along with rising sea levels in the Passaic River Basin. The riverine and coastal spatial data generated as a result of this study (25- and 100-year precipitation events for today and planning horizons 2045 and 2080) were used to help understand potential changes in flood impacts in Passaic County. Figure 4.3.7-4 illustrates the locations in Passaic County that are projected to experience sea level rise according to this study.

Figure 4.3.7-4. Projected Area Impacted by Sea Level Rise in Passaic County



Extent

The severity of a flood event is typically determined by a combination of several factors including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and degree of vegetative clearing and impervious surface. The frequency and severity of riverine flooding are measured using a discharge probability, which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels.

Floodplains are often referred to as 100-year floodplains. A 100-year floodplain is not a flood that will occur once every 100 years; the designation indicates a flood that has a 1-percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. Due to this misleading term, FEMA has properly defined it as the 1-percent annual chance flood. Similarly, the 500-year floodplain will not occur every 500 years but is an event with a 0.2-percent chance of being equaled or exceeded each year. The "1-percent annual chance flood" is now the standard term used by most federal and state agencies and by the National Flood Insurance Program (NFIP) (FEMA 2003). The 1-percent annual chance floodplain establishes the area that has flood insurance and floodplain management requirements and is also referenced as the regulatory floodplain.

The NJDEP is mandated to delineate and regulate flood hazard areas pursuant to N.J.S.A. 58:16A-50 et seq., the Flood Hazard Area Control Act. This Act authorizes the DEP to adopt land use regulations for development within the flood hazard areas, to control stream encroachments and to integrate the flood control activities of the municipal, county, state and federal governments. The State's Flood Hazard Area delineations are defined by the New Jersey Flood Hazard Area Design Flood which is equal to a design flood discharge 25% greater in flow than the 1-percent annual chance flood. In addition, the floodway shall be based on encroachments that produce no more than a 0.2-foot water surface rise above the 1-percent annual chance flood.

The USGS National Water Information System (NWIS) collects surface water data from more than 850,000 stations across the country. The time-series data describes stream levels, streamflow (discharge), reservoir and lake levels, surface water quality, and rainfall. The data is collected by automatic recorders and manual field measurements at the gage locations.

In the case of riverine flood hazard, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations (NWS 2011).

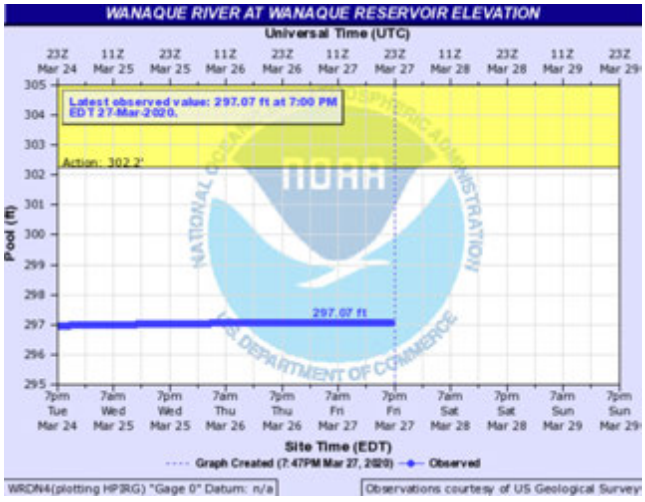
Passaic County has 13 active USGS stream gages; in addition, stream gauges are located upstream in neighboring counties. The flood stage is identified at each gage. Passaic County and its municipalities rely on these gages to determine the height of the rivers during heavy rain events and to determine whether or not residents need to evacuate. Table 4.3.7-2 shows the thirteen gages in the County with their determined flood stage and their record flood event. The USGS website provides details about each of the gages (https://waterwatch.usgs.gov/index.php) and the gage heights of flooding events. The NWS provides the different flood stages for the gages (https://water.weather.gov/ahps/).

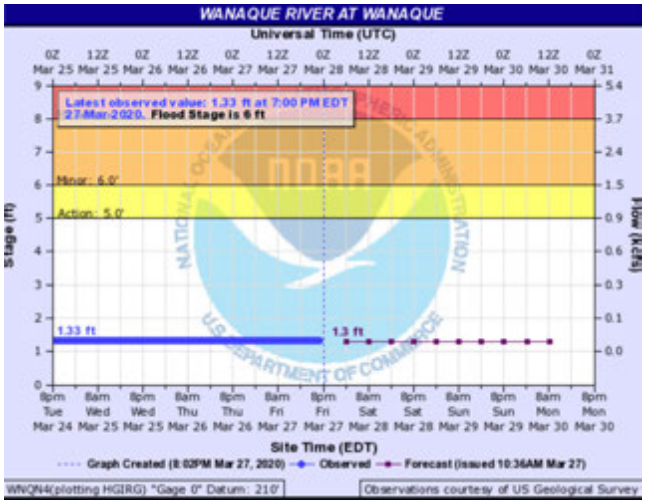
Table 4.3.7-2. Stream Gage Statistics for Passaic County

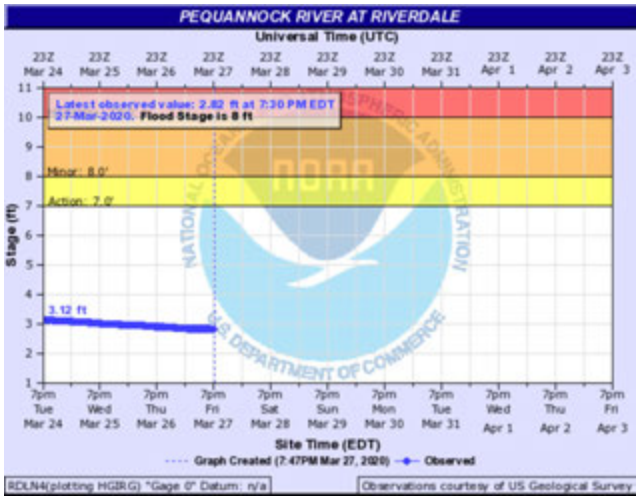
Gage Site Number	Site Name	Action Stage (feet)	Minor Flood Stage (feet)	Moderate Flood Stage (feet)	Major Flood Stage (feet)	Record Flood
WRDN4	Wanaque River at Wanaque Reservoir Elevation	302.25	Not Available	Not Available	Not Available	Not Available
WNQN4	Wanaque River at Wanaque	5.0	6.0	8.0	9.0	10.82ft on 04/05/1984
PMPN4	Ramapo River at Lakeside Ave at Pompton Lakes	Not Available	Not Available	Not Available	Not Available	Not Available
RDLN4	Pequannock River at Riverdale	7.0	8.0	10.0	11.0	13.60ft on 04/05/1984
PPTN4	Ramapo River at Pompton Lakes	10.0	11.5	13.5	14.5	22.62ft on 0829/2011
PLUN4	Ramapo River at Pompton Lakes Dam	11.5	Not Available	Not Available	Not Available	15.6 ft on 04/03/2005
PPPN4	Pompton River at Pompton Plains	13.0	16.0	18.0	19.0	25.24ft on 08/29/2011
POMN4	Ramapo River at Dawes Highway at Pompton Lakes	Not Available	Not Available	Not Available	Not Available	Not Available
MOLN4	Molly Ann Brook at N. Haledon	5.8	6.0	8.0	10.0	10.93ft on 05/16/1990
SIGN4	Passaic River at Singac	7.0	8.5	10.0	12.0	9.65ft on 05/03/2014
LTFN4	Passaic River at Little Falls	6.5	7.0	8.0	9.0	17.5ft on 10/10/1903
BETN4	Passaic River above Beatties Dam	10.3	11.3	Not Available	Not Available	Not Available
DDCN4	Passaic River at Clifton (Dundee Dam)	3.5	4.5	6.0	7.0	8.40ft on 10/10/1903

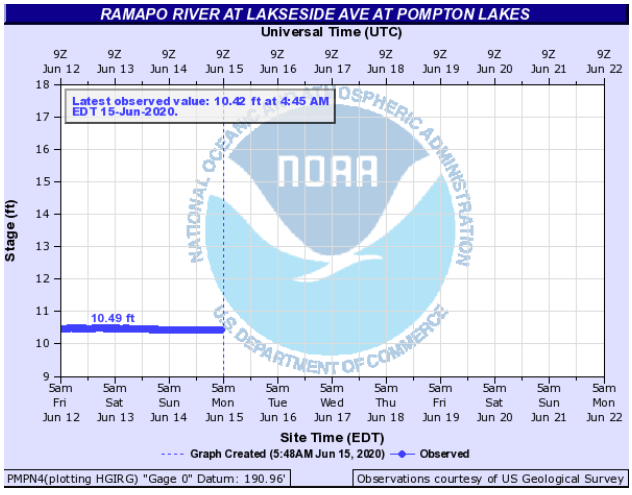
Source: USGS 2020

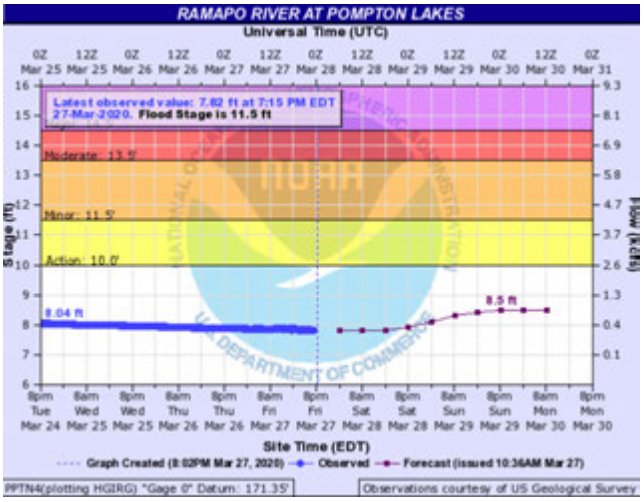
Figure 4.3.7-5. Flood Hydrographs for the Gages in Passaic County

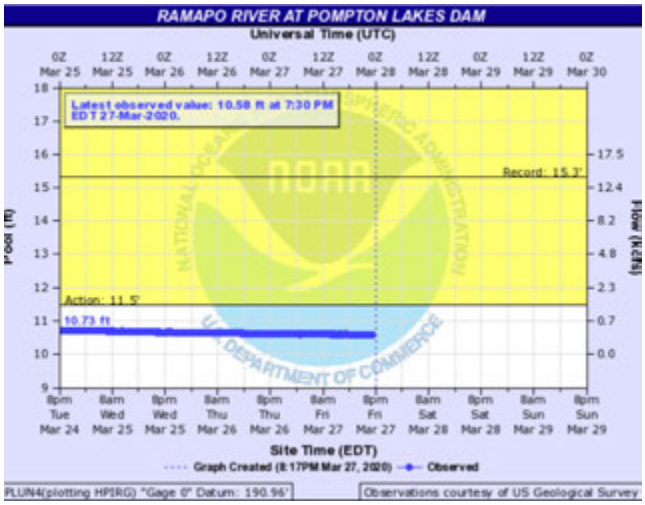


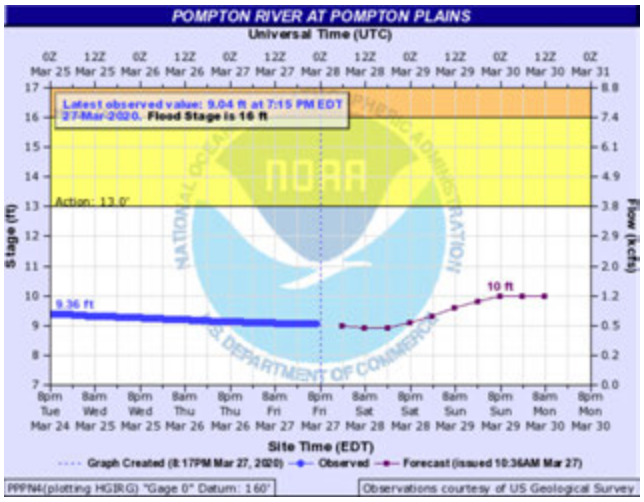


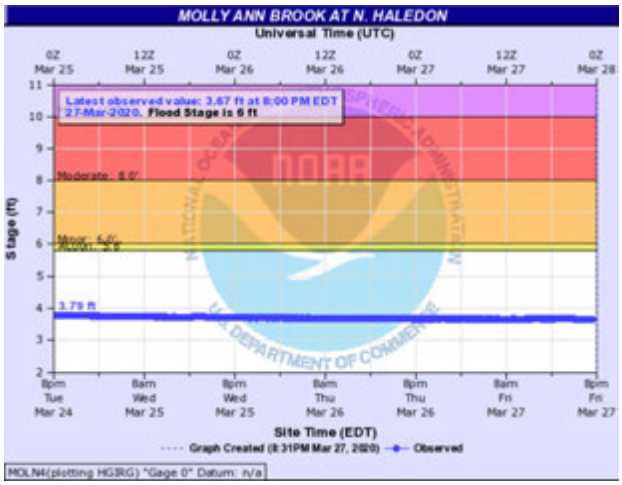


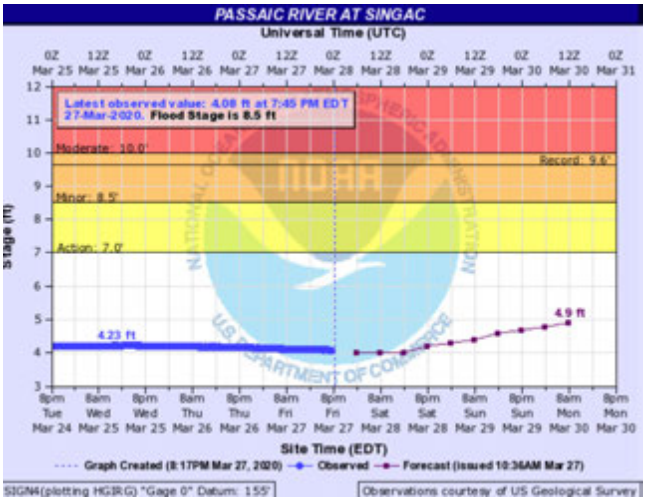


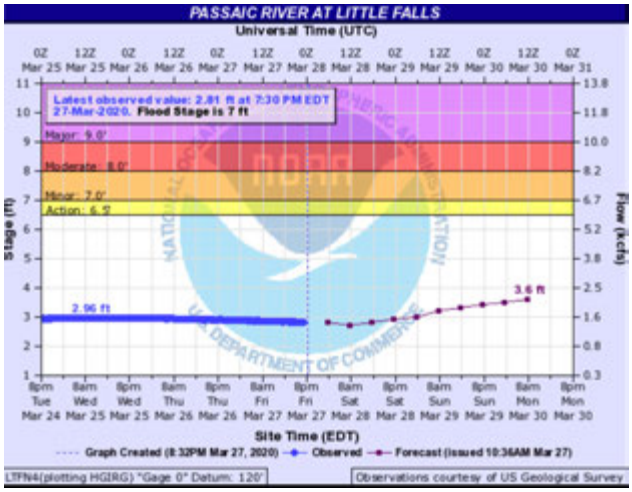


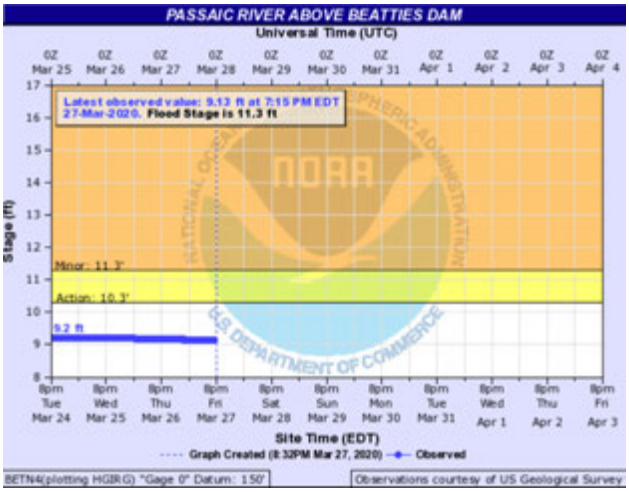


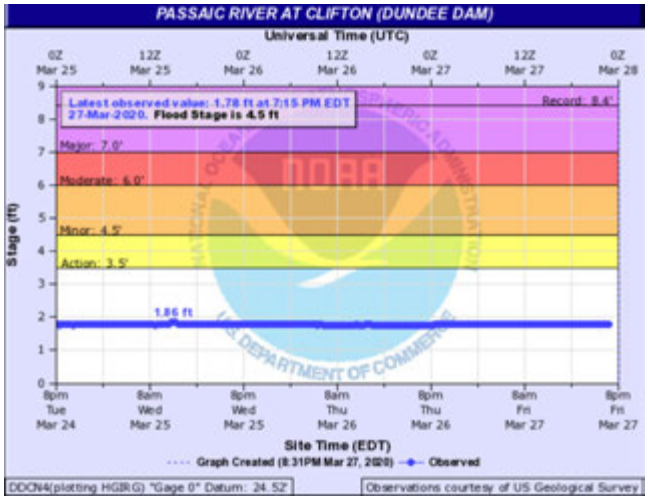

POMPTON RIVER AT POMPTON PLAINS
Universal Time (UTC)
Latest observed value: 9.04 ft at 7:15 PM EDT 27-Mar-2020. Flood Stage is 16 ft
Action: 13.0'
9.36 ft
10 ft
Stage (ft)
Flow (kcfs)
Site Time (EDT)
Graph Created (8:17PM Mar 27, 2020)
Observed
Forecast (issued 10:36AM Mar 27)
PPFN4(plotting HGIRG) "Gage 0" Datum: 160'
Observations courtesy of US Geological Survey

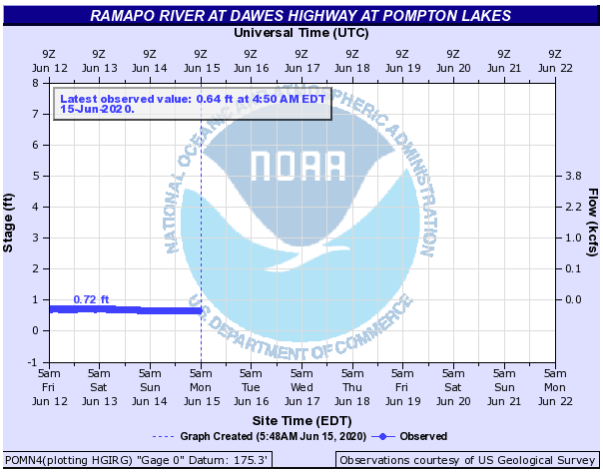

MOLLY ANN BROOK AT N. HALEDON
Universal Time (UTC)
Latest observed value: 3.67 ft at 8:00 PM EDT 27-Mar-2020. Flood Stage is 6 ft
Moderate: 8.0'
Minor: 6.0'
3.79 ft
Stage (ft)
Site Time (EDT)
Graph Created (8:31PM Mar 27, 2020)
Observed
MOLN4(plotting HGIRG) "Gage 0" Datum: n/a


PASSAIC RIVER AT SINGAC
Universal Time (UTC)
Latest observed value: 4.08 ft at 7:45 PM EDT 27-Mar-2020. Flood Stage is 8.5 ft
Moderate: 10.0'
Record: 9.6'
Minor: 8.5'
Action: 7.0'
4.23 ft
4.9 ft
Stage (ft)
Site Time (EDT)
Graph Created (8:17PM Mar 27, 2020)
Observed
Forecast (issued 10:36AM Mar 27)
SIGN4(plotting HGIRG) "Gage 0" Datum: 155'
Observations courtesy of US Geological Survey


PASSAIC RIVER AT LITTLE FALLS
Universal Time (UTC)
Latest observed value: 2.81 ft at 7:30 PM EDT 27-Mar-2020. Flood Stage is 7 ft
Major: 9.0'
Moderate: 8.0'
Minor: 7.0'
Action: 6.5'
2.96 ft
3.6 ft
Stage (ft)
Flow (kcfs)
Site Time (EDT)
Graph Created (8:32PM Mar 27, 2020)
Observed
Forecast (issued 10:36AM Mar 27)
LTFN4(plotting HGIRG) "Gage 0" Datum: 120'
Observations courtesy of US Geological Survey


PASSAIC RIVER ABOVE BEATTIES DAM
Universal Time (UTC)
Latest observed value: 9.13 ft at 7:15 PM EDT 27-Mar-2020. Flood Stage is 11.3 ft
Minor: 11.3'
Action: 10.3'
9.2 ft
Stage (ft)
Site Time (EDT)
Graph Created (8:32PM Mar 27, 2020)
Observed
BETN4(plotting HGIRG) "Gage 0" Datum: 150'
Observations courtesy of US Geological Survey


PASSAIC RIVER AT CLIFTON (DUNDEE DAM)
Universal Time (UTC)
Latest observed value: 1.78 ft at 7:15 PM EDT 27-Mar-2020. Flood Stage is 4.5 ft
Record: 8.4'
Major: 7.0'
Moderate: 6.0'
Minor: 4.5'
Action: 3.5'
1.86 ft
Stage (ft)
Site Time (EDT)
Graph Created (8:31PM Mar 27, 2020)
Observed
DDCN4(plotting HGIRG) "Gage 0" Datum: 24.52'
Observations courtesy of US Geological Survey



Source: USGS 2020

Currently, there is no measurement used to further define the frequency and severity of urban flooding.

Previous Occurrences and Losses

Between 1954 and 2019, FEMA declared that the State of New Jersey experienced 26 flood-related DRs or EMs classified as one or a combination of the following disaster types: hurricane, tropical storm, Nor'Easter, snowstorm, severe storms, flooding, inland and coastal flooding, coastal storm, high tides, heavy rain, and severe storms (Table 4.3.7-3). Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Passaic County was included in 13 of these flood-related declarations (FEMA 2020, New Jersey State HMP 2019).

Table 4.3.7-3. Flood-Related FEMA Declarations for Passaic County, 1954 to 2019

FEMA Declaration Number	Date(s) of Incident	Incident Type	Incident Title
DR-245	June 18, 1968	Flooding	New Jersey Heavy Rains, Flooding
DR-310	September 4, 1971	Flooding	New Jersey Heavy Rains, Flooding
DR-477	July 23, 1975	Heavy Rains, High Winds, Hail, Tornadoes	New Jersey Heavy Rains, High Winds, Hail, Tornadoes
DR-701	March 28, 1984 – April 8, 1984	Flooding	New Jersey Coastal Storms, Flooding
DR-1295	September 16, 1999 – September 18, 1999	Heavy Rains, Flooding	Hurricane Floyd
DR-1588	April 1, 2005 – April 3, 2005	Flooding	Severe Storms and Flooding
DR-1694	April 14, 2007 – April 20, 2007	Flooding	Severe Storms and Inland and Coastal Flooding
DR-1897	March 12, 2010 – April 15, 2010	Flooding	Severe Storms and Flooding
DR-1954	December 26, 2010 – December 27, 2010	Severe Winter Storm	Severe Winter Storm and Snowstorm
DR-4021	August 27, 2011 – September 5, 2011	Heavy Rains, Flooding	Hurricane Irene
DR-4039	September 28, 2011 – October 6, 2011	Rains, Flooding	Remnants of Tropical Storm Lee
DR-4086	October 26, 2012 – November 8, 2012	Heavy Rains, Flooding	Hurricane Sandy

FEMA Declaration Number	Date(s) of Incident	Incident Type	Incident Title
DR-4368	March 6, 2018 – March 7, 2018	Severe Winter Storm	New Jersey Severe Winter Storm and Snowstorm

Source: NOAA NCEI, FEMA, New Jersey HMP 2019

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events database records and defines flood events as follows:

- Flash Flood is reported in the NOAA-NCEI database for a life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam).
- Flood is reported in the NOAA-NCEI database for any high flow, overflow, or inundation by water which causes damage. In general, this would mean the inundation of a normally dry area caused by an increased water level in an established watercourse, or ponding of water, that poses a threat to life or property.

For the 2020 HMP update, known flood events that have impacted Passaic County between 2015 and 2020 are summarized in Table 4.3.7-4. Appendix E (Supplemental Data) contains details on flood events that occurred prior to 2015.

Table 4.3.7-4. Flood Events in Passaic County, 2015 to 2020

Dates of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
January 24, 2015	Heavy Snow	N/A	N/A	A system of low pressure brought heavy snow to western Passaic County.
February 1, 2015	Heavy Snow	N/A	N/A	A wintery mix brought 5-12 inches of snowfall and a third of an inch of ice to the eastern Passaic County area.
May 31, 2015	Flash Flood	N/A	N/A	A cold front approaching the area triggered scattered showers and thunderstorms that produced heavy rain leading to flash flooding in the Clifton area.
June 15, 2015	Flash Flood	N/A	N/A	Heavy rain resulted in isolated flash flooding in the Clifton area.
January 23, 2016	Winter Storm	N/A	N/A	Blizzard conditions were in effect throughout the county causing whiteout conditions and causing public transit shut downs and flight cancellations. Governor Chris Christie declared a State of Emergency.
July 31, 2016	Flash Flood	N/A	N/A	Flash flooding occurred across Passaic and Bergen counties including several water rescues.
February 9, 2017	Winter Storm	N/A	N/A	A low brought heavy snow and strong winds to portions of Northeast New Jersey, including Passaic County. Numerous flights were cancelled or delayed at Newark Airport.
March 14, 2017	Winter Storm	N/A	N/A	A deep low pressure brought blizzard conditions including heavy snow and sleet along with strong winds to western Passaic County.
July 1, 2017	Heavy Rain	N/A	N/A	Scattered showers and thunderstorms caused flooding along the Preakness Brook to runoff resulting in flooding in the Wayne area.

Dates of Event	Event Type	FEMA Declaration Number (if applicable)	County Designated?	Event Details
July 1, 2017	Flash Flood	N/A	N/A	A slow-moving storm resulted in isolated flash flooding in the Pompton Junction area.
August 2, 2017	Flash Flood	N/A	N/A	Over an inch of rain fell in the Mountain View, Singac and South Paterson areas causing flash flooding.
August 5, 2017	Flash Flood	N/A	N/A	Showers and thunderstorms affected the Clifton area bringing isolated flash flooding to the area.
October 29-30, 2017	Heavy Rain	N/A	N/A	A wave of low pressure formed along a slow-moving cold front before rapidly deepening off the Mid Atlantic coast during the evening. This resulted in reports of flooding statewide.
February 17, 2018	Heavy Snow	N/A	N/A	A low-pressure system brought heavy snow to Passaic County causing 6-7 inches of snowfall.
March 1, 2018	Winter Storm	N/A	N/A	A stalled winter storm brought heavy rain conditions to the higher elevation portions of Passaic County. Winds also gusted 40 to 50 mph across western Passaic County.
March 6, 2018 – March 7, 2018	Severe Winter Storm	DR-4368	Yes	New Jersey Severe Winter Storm and Snowstorm
April 16, 2018	Flash Flood	N/A	N/A	Thunderstorms generated 2.5 to 4.5 inches of rainfall across northeast New Jersey within a 3-4 hour period resulting in flash flooding across the region including Passaic County and the Haledon area.
July 5, 2018	Flash Flood	N/A	N/A	Showers and storms produced isolated flash flooding across parts of Passaic County including Skyline Lake.
August 11, 2018	Flash Flood	N/A	N/A	Thunderstorms brought 2.5 inches to 4 inches of precipitation. The Little Falls area of Passaic County was particularly affected by rising water from the Peckman River.
October 2, 2018	Flash Flood	N/A	N/A	Showers and thunderstorms developed causing flash flooding in the Wanaque area.
November 15, 2018	Winter Storm	N/A	N/A	A cold weather trough brought snowfall rates at 1-2 inches per hour causing downed trees, tree limbs and cancelled flights.
March 3, 2019	Heavy Snow	N/A	N/A	A cold weather system brought 6-8 inches of snow to the Passaic County area.
July 11, 2019	Flash Flood	N/A	N/A	Showers and thunderstorms dropped 1-3 inches of rainfall to the Clifton and Pompton Junction area.
August 7, 2019	Flash Flood	N/A	N/A	Showers and thunderstorms brought close to 2 inches of rain within only a few hours to the Little Falls area.
December 1, 2019	Heavy Snow	N/A	N/A	A large area of low pressure dropped 7-9 inches of snow to the Passaic County area.

Source: NOAA NCEI, FEMA, New Jersey HMP 2019

Probability of Future Occurrences

Given the history of flood events that have impacted Passaic County, it is anticipated the County will continue to be at risk to flooding. It is estimated that Passaic County will continue to experience direct and indirect impacts of flooding events annually that may induce secondary hazards such as erosion, storm surge in coastal areas, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents, and inconveniences.

As defined by FEMA, geographic areas within the 100-year floodplain in Passaic County are estimated to have a 1% chance of flooding in any given year. A structure located within a 100-year floodplain has a 26% chance of suffering flood damage during the term of a 30-year mortgage. Geographic areas in Passaic County located within the 500-year flood boundary are estimated to have a 0.2% chance of being flooded in any given year (FEMA 2003; FEMA 2006).

According to the NOAA National Climate Data Center (NCDC) and the CRREL database, Passaic County experienced 101 flood events between 1950 and 2020, including 52 floods and 49 flash floods. The table below shows these statistics, as well as the annual average number of events and the percent chance of these individual flood hazards occurring in Passaic County in future years based on the historic record (NOAA NCEI 2020).

Table 4.3.7-5. Probability of Future Occurrence of Flooding Events

Hazard Type	Number of Occurrences Between 1950 and 2019	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent (%) chance of occurrence in any given year
Flash Flood	49	0.71	1.4	0.70	70.0
Flood	52	0.75	1.4	0.74	74.3
Total	**101**	**1.46**	**0.69**	**1.44**	**100**

Source: NOAA-NCEI 2020

Note: Probability was calculated using the available data provided in the NOAA-NCEI storm events database. Due to limitations in data, not all flood events occurring between 1950 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is under-estimated. A 100 percent chance of occurring means that at least one flood event is likely to occur annually in Passaic County.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for flood in the county is considered "frequent".

Climate Change Impacts

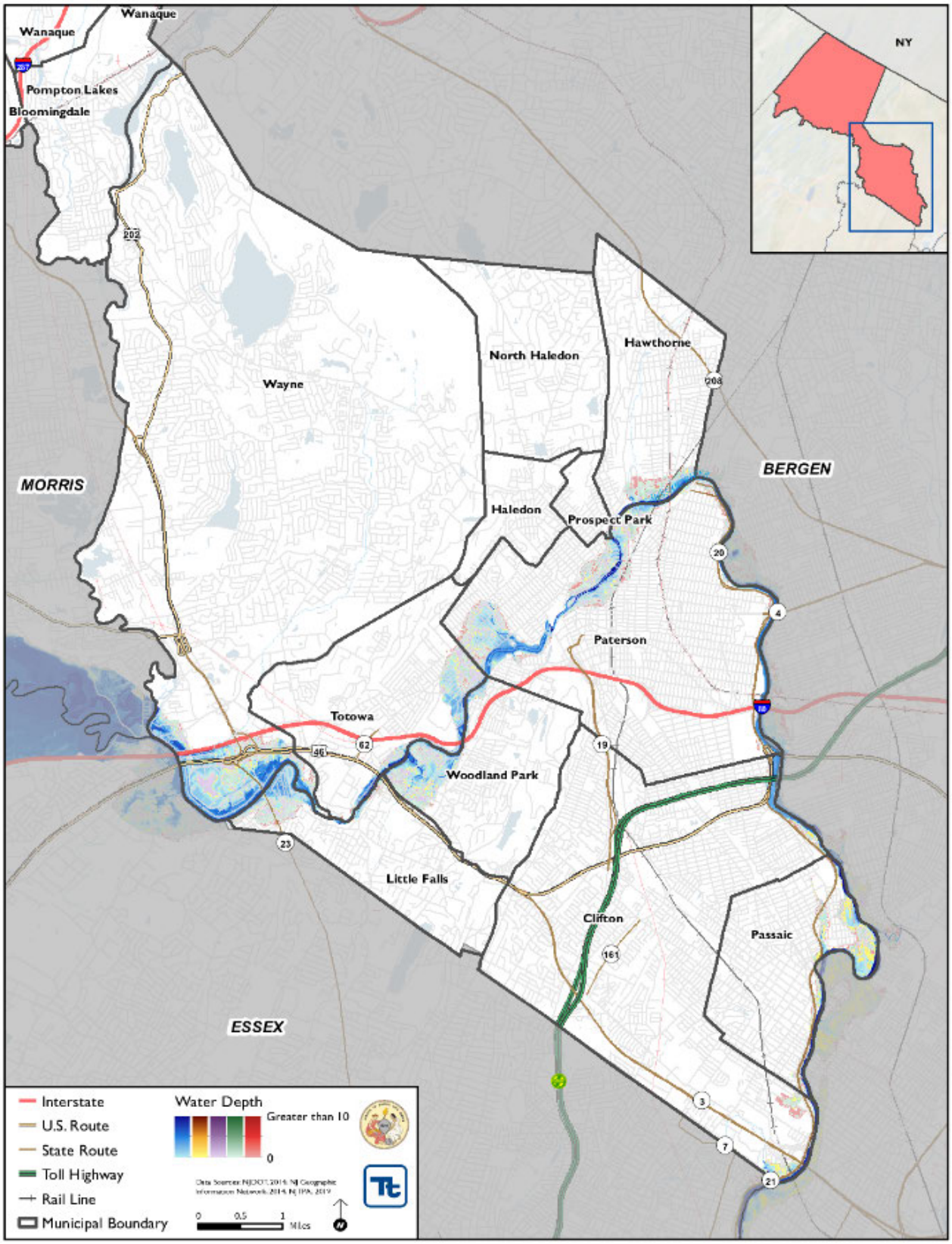
According to the NJDEP, New Jersey is experiencing increased intensity, frequency and duration of storm events (NJDEP 2019). Northern New Jersey's 1971-2000 precipitation average was over five inches (12-percent) greater than the average from 1895-1970 (Sustainable Jersey Climate Change Adaptation Task Force [CATF] 2011). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Average annual precipitation is projected to increase in the region by four to 11-percent by the 2050s and five to 13-percent by the 2080s (New York City Panel on Climate Change [NPCC] 2015). Increased rainfall and heavy rainfalls increase the risk of flooding events.

Annual precipitation for New Jersey has been about 8% above average over the last 10 years. The number of extreme precipitation events has also been above average over the last 10 years. During 2010 to 2014, the State experienced the largest number of extreme precipitation events (days with more than 2 inches) compared to any

other 5-year period, about 50 percent above the long-term average. Winter and spring precipitation are projected to increase for the 21st century; extreme precipitation is also projected to increase. The projections of increasing precipitation are characteristic of a large area of the Northern Hemisphere in the northern middle latitudes, as well as increases in heavy precipitation events. This may result in increased coastal and inland flooding risks throughout the State (NCEI 2019).

As noted above, NJTPA recently completed the Passaic River Basin Climate Resilience Planning Study (2019) which assessed the potential for increasingly severe and frequent storm and heat events along with rising sea levels in the Passaic River Basin. Figure 4.3.7-6 illustrates the areas projected to experience increased flooding for the 25- and 100-year precipitation events at planning horizons 2045 and 2080. Note, the study area only focused on the Passaic River Basin and therefore other areas in the County may also experience an expanded floodplain if the severity and frequency of storm events change.

Figure 4.3.7-6. NJTPA Projected Areas of Flooding in 2045 and 2080



4.3.7.2 Vulnerability Assessment

To assess Passaic County's risk to the flood hazard, a spatial analysis was conducted using the best available spatially-delineated flood hazard areas. The 1- and 0.2-percent annual chance flood events were examined to determine the assets located in the hazard areas and to estimate potential loss using the FEMA HAZUS-MH v4.2 model. These results are summarized below. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess flood risk.

Impact on Life, Health, and Safety

The impact of flooding on life, health, and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the effects of a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not strictly measurable.

To estimate population exposure to the 1-percent- and 0.2-percent annual chance flood events, the DFIRM flood boundaries were used. Based on the spatial analysis, there are an estimated 17,849 residents living in the SFHA (or 1-percent annual chance floodplain), or 3.5% of the County's total population. There are an estimated 29,702 residents living in the 0.2-percent annual chance floodplain, or 5.8% of the County's total population. Pompton Lakes has the greatest number of residents living in the floodplain with approximately 21.6% of its residents living in the SFHA. Table 4.3.7-6 summarizes the population exposed to the flood hazard by municipality.

Table 4.3.7-6. Estimated Population Exposed to the Flood Hazard

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed			
		1-percent Annual Chance Flood	Percent (%) of Total	0.2-percent Annual Chance Flood	Percent (%) of Total
Bloomingdale, Borough of	8,139	693	8.5%	777	9.5%
Clifton, City of	86,207	109	0.1%	946	1.1%
Haledon, Borough of	8,440	4	0.1%	151	1.8%
Hawthorne, Borough of	19,065	151	0.8%	241	1.3%
Little Falls, Township of	14,524	2,538	17.5%	3,340	23.0%
North Haledon, Borough of	8,564	87	1.0%	121	1.4%
Passaic, City of	71,057	796	1.1%	3,509	4.9%
Paterson, City of	147,890	4,795	3.2%	9,003	6.1%
Pompton Lakes, Borough of	11,205	2,416	21.6%	3,171	28.3%
Prospect Park, Borough of	5,955	0	0.0%	98	1.6%
Ringwood, Borough of	12,451	84	0.7%	122	1.0%
Totowa, Borough of	10,829	1,017	9.4%	1,419	13.1%
Wanaque, Borough of	11,782	272	2.3%	347	2.9%
Wayne, Township of	55,154	3,584	6.5%	4,123	7.5%
West Milford, Township of	26,759	273	1.0%	655	2.4%
Woodland Park, Borough of	12,542	1,029	8.2%	1,680	13.4%

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed			
		1-percent Annual Chance Flood	Percent (%) of Total	0.2-percent Annual Chance Flood	Percent (%) of Total
Passaic County (Total)	**510,562**	**17,849**	**3.5%**	**29,702**	**5.8%**

Sources: American Community Survey 2017; FEMA 2020

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. There are 86,667 persons below the poverty level and 69,429 persons that are over 65 years old in the County. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact to their family. The population over the age of 65 is more vulnerable because they are more likely to seek or need medical attention which may not be available to due isolation during a flood event and they may have more difficulty evacuating. Special consideration should be taken when planning for disaster preparation, response, and recovery for these vulnerable groups.

In addition, displaced populations were estimated for the 1-percent annual chance flood event. Using 2010 U.S. Census data, HAZUS-MH 4.2 estimates 30,397 people may be displaced and 1,849 people may seek short-term sheltering. These statistics, by municipality, are presented in Table 4.3.7-7.

Table 4.3.7-7. Estimated Population Displaced or Seeking Short-Term Shelter from a 1% Annual Chance Flood Event

Municipality	2010 U.S. Census Population	1% Annual Chance Flood Event	
		Displaced Population	Persons Seeking Short-Term Sheltering
Bloomingdale, Borough of	7,656	1,158	25
Clifton, City of	84,136	1,238	80
Haledon, Borough of	8,318	222	2
Hawthorne, Borough of	18,791	535	10
Little Falls, Township of	14,432	2283	121
North Haledon, Borough of	8,417	400	5
Passaic, City of	69,781	2,646	375
Paterson, City of	146,199	6650	565
Pompton Lakes, Borough of	11,097	3311	149
Prospect Park, Borough of	5,865	106	4
Ringwood, Borough of	12,228	594	17
Totowa, Borough of	10,804	1,562	76
Wanaque, Borough of	11,116	1,239	48
Wayne, Township of	54,717	5,475	277
West Milford, Township of	25,850	1332	22
Woodland Park, Borough of	11,819	1,646	73
Passaic County (Total)	**501,226**	**30,397**	**1,849**

Source: HAZUS-MH 4.2; FEMA 2020
Notes: Estimated displaced persons and sheltering is based on 2010 U.S. Census data.

The total number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades, and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results from persons trying to cross flooded roadways or channels during a flood.

Cascading impacts may also include exposure to pathogens such as mold. After flood events, excess moisture and standing water contribute to the growth of mold in buildings. Mold may present a health risk to building occupants, especially those with already compromised immune systems such as infants, children, the elderly and pregnant women. The degree of impact will vary and is not strictly measurable. Mold spores can grow in as short a period as 24-48 hours in wet and damaged areas of buildings that have not been properly cleaned. Very small mold spores can easily be inhaled, creating the potential for allergic reactions, asthma episodes, and other respiratory problems. Buildings should be properly cleaned and dried out to safely prevent mold growth (CDC 2019).

Molds and mildews are not the only public health risk associated with flooding. Floodwaters can be contaminated by pollutants such as sewage, human and animal feces, pesticides, fertilizers, oil, asbestos, and rusting building materials. Common public health risks associated with flood events also include:

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals
- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Mental stress and fatigue

Current loss estimation models such as HAZUS-MH are not equipped to measure public health impacts. The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with these vulnerabilities in responding to flood events.

Impact on General Building Stock

After considering the population exposed and potentially vulnerable to the flood hazard, the built environment was evaluated. Exposure includes those buildings located in the flood zone. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content replacement cost values. Table 4.3.7-8 summarizes these results county-wide.

In summary, there are 5,435 buildings located in the 1-percent annual chance flood boundary with an estimated $12.5 billion of replacement cost value (i.e., building and content replacement costs). In total, this represents approximately 7.7% of the County's total general building stock inventory. In addition, there are 13,481 buildings located in the 0.2-percent annual chance flood boundary with an estimated $32.9 billion of building stock and contents exposed. This represents approximately 20.1% of the County's total general building stock inventory.

The HAZUS-MH flood model estimated potential damages to the buildings in Passaic County at the structure level using the custom structure inventory developed for this HMP and the depth grid generated using the effective DFIRM data. The potential damage estimated by HAZUS-MH to the general building stock inventory associated with the 1-percent annual chance flood is approximately $469 million or less than 1% of the total building stock improvement value. The Borough of Pompton Lakes has the greatest amount of estimated building loss (i.e., 5.5% of total RCV). Refer to Table 4.3.7-9 for the estimated losses by jurisdiction, which also shows the estimated losses for residential and commercial structures, respectively.

Table 4.3.7-8. Estimated General Building Stock Located in the FEMA Flood Zones - All Occupancies

Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed							
			1-Percent Annual Chance Flood Event				0.2-Percent Annual Chance Flood Event			
			Number of Buildings	Percent (%) of Total	RCV - 1-percent Annual Chance Flood	Percent (%) of Total	0.2-percent Annual Chance Flood	Percent (%) of Total	RCV - 0.2-percent Annual Chance Flood	Percent (%) of Total
Bloomingdale, Borough of	2,611	$1,784,142,939	217	8.3%	$93,863,206	5.3%	468	17.9%	$216,135,864	12.1%
Clifton, City of	21,859	$21,649,495,205	61	0.3%	$429,997,064	2.0%	278	1.3%	$1,248,659,537	5.8%
Haledon, Borough of	1,809	$1,708,591,489	2	0.1%	$34,455,888	2.0%	44	2.4%	$149,136,512	8.7%
Hawthorne, Borough of	5,923	$4,588,063,085	81	1.4%	$210,624,982	4.6%	222	3.7%	$767,134,077	16.7%
Little Falls, Township of	3,412	$4,633,701,650	674	19.8%	$836,194,625	18.0%	1,594	46.7%	$2,533,391,120	54.7%
North Haledon, Borough of	2698	$2,317,277,271	30	1.1%	$19,360,060	0.8%	73	2.7%	$48,814,871	2.1%
Passaic, City of	6,918	$11,948,345,444	67	1.0%	$331,239,681	2.8%	336	4.9%	$1,151,536,237	9.6%
Paterson, City of	23,609	$55,984,762,201	1,220	5.2%	$5,140,102,775	9.2%	3,255	13.8%	$13,469,421,254	24.1%
Pompton Lakes, Borough of	3,081	$1,853,779,603	797	25.9%	$365,962,802	19.7%	1,827	59.3%	$849,093,034	45.8%
Prospect Park, Borough of	1,101	$709,318,581	2	0.2%	$5,628,416	0.8%	21	1.9%	$19,077,970	2.7%
Ringwood, Borough of	4,486	$2,724,021,483	35	0.8%	$17,326,045	0.6%	87	1.9%	$43,768,770	1.6%
Totowa, Borough of	3,771	$6,476,350,669	373	9.9%	$413,871,479	6.4%	916	24.3%	$1,715,813,782	26.5%
Wanaque, Borough of	3,157	$2,211,149,264	81	2.6%	$82,659,003	3.7%	185	5.9%	$175,855,722	8.0%
Wayne, Township of	17,646	$19,125,773,073	1,252	7.1%	$2,946,677,142	15.4%	2,694	15.3%	$6,637,949,085	34.7%
West Milford, Township of	10,794	$9,348,319,367	151	1.4%	$501,884,900	5.4%	474	4.4%	$1,208,425,822	12.9%
Woodland Park, Borough of	3,473	$17,134,672,551	392	11.3%	$1,161,957,751	6.8%	1,007	29.0%	$2,754,072,882	16.1%
Passaic County (Total)	**116,348**	**$164,197,763,874**	**5,435**	**4.7%**	**$12,591,805,819**	**7.7%**	**13,481**	**11.6%**	**$32,988,286,537**	**20.1%**

Source: FEMA 2020; Passaic County; RS Means 2019
Notes:
RCV Replacement Cost Value

Table 4.3.7-9. Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event

Municipality	Total Replacement Cost Value	All Occupancies		Residential		Commercial		Agricultural, Industrial, Religious, Education and Government	
		Estimated Loss	Percent (%) of Total	Estimated Loss	Percent (%) of Total	Estimated Loss	Percent (%) of Total	Estimated Loss	Percent (%) of Total
Bloomingdale, Borough of	$1,784,142,939	$14,514,341	0.8%	$13,931,938	0.8%	$582,402	0.0%	$0	0.0%
Clifton, City of	$21,649,495,205	$4,717,444	0.0%	$3,193,579	0.0%	$581,130	0.0%	$942,736	0.0%
Haledon, Borough of	$1,708,591,489	$470,875	0.0%	$333,478	0.0%	$0	0.0%	$137,397	0.0%
Hawthorne, Borough of	$4,588,063,085	$7,599,231	0.2%	$2,702,075	0.1%	$3,415,554	0.1%	$1,481,602	0.0%
Little Falls, Township of	$4,633,701,650	$31,008,960	0.7%	$27,304,991	0.6%	$2,329,866	0.1%	$1,374,103	0.0%
North Haledon, Borough of	$2,317,277,271	$1,390,394	0.1%	$1,246,181	0.1%	$551	0.0%	$143,662	0.0%
Passaic, City of	$11,948,345,444	$8,408,237	0.1%	$5,184,946	0.0%	$2,008,033	0.0%	$1,215,258	0.0%
Paterson, City of	$55,984,762,201	$123,320,761	0.2%	$72,709,783	0.1%	$22,540,474	0.0%	$27,977,985	0.0%
Pompton Lakes, Borough of	$1,853,779,603	$102,574,484	5.5%	$92,666,801	5.0%	$7,651,878	0.4%	$2,255,806	0.1%
Prospect Park, Borough of	$709,318,581	$164,905	0.0%	$78,462	0.0%	$86,443	0.0%	$0	0.0%
Ringwood, Borough of	$2,724,021,483	$4,289,281	0.2%	$4,173,337	0.2%	$0	0.0%	$11,594	0.0%
Totowa, Borough of	$6,476,350,669	$27,695,962	0.4%	$24,338,619	0.4%	$2,896,203	0.0%	$461,140	0.0%
Wanaque, Borough of	$2,211,149,264	$2,338,238	0.1%	$2,011,127	0.1%	$95,925	0.0%	$231,186	0.0%
Wayne, Township of	$19,125,773,073	$104,713,063	0.5%	$85,191,617	0.4%	$14,848,309	0.1%	$4,673,137	0.0%
West Milford, Township of	$9,348,319,367	$8,977,962	0.1%	$8,397,998	0.1%	$357,556	0.0%	$222,408	0.0%
Woodland Park, Borough of	$17,134,672,551	$27,310,317	0.2%	$13,195,931	0.1%	$11,836,611	0.1%	$2,277,776	0.0%
Passaic County (Total)	**$164,197,763,874**	**$469,494,456**	**0.3%**	**$356,660,863**	**0.2%**	**$69,230,935**	**0.0%**	**$43,510,138**	**0.0%**

Source: HAZUS-MH 4.2; FEMA 2020; RS Means 2019

NFIP Statistics

NJOEM and FEMA provided a list of properties with NFIP policies, past claims, and multiple claims. According to FEMA, a repetitive loss (RL) property is a NFIP-insured structure that has had at least two paid flood losses of more than $1,000 in any 10-year period since 1978. A severe repetitive loss (SRL) property is a NFIP-insured structure that has had four or more separate claim payments made under a standard flood insurance policy, with the amount of each claim exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000; or at least two separate claims payments made under a standard flood insurance policy with the cumulative amount of such claim payments exceed the fair market value of the insured building on the day before each loss (FEMA 2018).

Table 4.3.7-10 through Table 4.3.7-12 summarize the NFIP policies, claims, and repetitive loss statistics for Passaic County. The majority of the RL and SRL properties are single-family residences (80% of all repetitive loss properties). This information is current as of April 26, 2019. The location of the repetitive and severe repetitive flooding were geocoded by FEMA with the understanding that there are varying tolerances between how closely the longitude and latitude coordinates correspond to the location of the property address, or that the indication of some locations are more accurate than others.

Table 4.3.7-12 shows the number of policies and claims for the entire County and it should be noted that these numbers vary across sources (i.e., NFIP Bureau and Statistical Agency report different totals than the FEMA Region 2 dataset provide for this HMP).

Table 4.3.7-10. Occupancy Class of Repetitive Loss Structures in Passaic County

Occupancy Class	Total Number of Repetitive Loss Properties (Excludes Severe Repetitive Loss Properties)	Total Number of Severe Repetitive Loss Properties (Valid Only*, Excludes Repetitive Loss Properties)	Total Repetitive Loss Properties and Severe Repetitive Loss Properties
Single Family	779	709	1,488
Assumed Condo	21	4	25
2-4 Family	110	38	148
Other Residential	2	2	4
Non-Residential	76	29	105
Passaic County (Total)	**988**	**782**	**1,770**

Source: FEMA Region 2 2019
Note: Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA Region 2, and are current as of April 26, 2019.
**Valid means the Severe Repetitive Loss Indicator is equal to V, VN, VU, VNU, MV, and MVU. Repetitive Loss Properties include properties that have a Severe Repetitive Loss Indicator of P, PU, PNU, and are left blank. V = Valid Insured Residential SRL property; VN = Valid Insured Non-Residential SRL property; VU = Valid Uninsured Residential SRL property; VNU = Valid Uninsured Non-Residential SRL property; MV = Mitigated Valid Insured Residential SRL property; MVU = Mitigated Valid Uninsured Residential SRL property; P = Pending Insured Residential SRL property; PN = Pending Insured Non-Residential SRL property; PU = Pending Uninsured Residential SRL property; PNU = Pending Uninsured Non-Residential SRL property*

Table 4.3.7-11. Occupancy Class of Repetitive Loss Structures in Passaic County, by Municipality

Municipality	Repetitive Loss Properties (excludes Severe Repetitive Loss Properties)					Severe Repetitive Loss Properties (Valid Only*, Excludes Repetitive Loss Properties)				
	Single Family	Assumed Condo	2-4 Family	Other Residential	Non-Residential	Single Family	Assumed Condo	2-4 Family	Other Residential	Non-Residential
Bloomingdale, Borough of	8	1	3	0	1	0	0	0	0	0
Clifton, City of	4	0	1	0	2	1	0	0	0	1
Haledon, Borough of	0	0	1	0	0	0	0	0	0	0
Hawthorne, Borough of	1	2	5	0	9	0	0	1	0	3
Little Falls, Township of	128	0	3	0	4	127	0	3	0	3
North Haledon, Borough of	0	0	0	0	0	0	0	0	0	0
Passaic, City of	3	4	0	0	3	0	0	0	0	1
Paterson, City of	73	3	59	1	19	12	0	17	2	9
Pompton Lakes, Borough of	145	2	1	1	2	164	0	3	0	1
Prospect Park, Borough of	0	0	0	0	0	0	0	0	0	0
Ringwood, Borough of	1	0	1	0	0	0	0	0	0	0
Totowa, Borough of	31	1	8	0	0	6	0	1	0	1
Wanaque, Borough of	6	0	0	0	0	0	0	1	0	0
Wayne, Township of	316	8	7	0	21	391	4	8	0	9
West Milford, Township of	9	0	0	0	1	2	0	0	0	0
Woodland Park, Borough of	54	0	21	0	14	6	0	4	0	1
Passaic County (Total)	**779**	**21**	**110**	**2**	**76**	**709**	**4**	**38**	**2**	**29**

Source: FEMA Region 2, 2019

Notes: Multi-family designation is defined as two to four families. Repetitive loss and severe repetitive loss statistics provided by FEMA Region 2 and are current as of April 26, 2019. The statistics were summarized using the Community Name provided by FEMA Region 2.

**Valid means the Severe Repetitive Loss Indicator is equal to V, VN, VU, VNU, MV, and MVU. Repetitive Loss Properties include properties that have a Severe Repetitive Loss Indicator of P, PU, PNU, and are left blank. V = Valid Insured Residential SRL property; VN = Valid Insured Non-Residential SRL property; VU = Valid Uninsured Residential SRL property; VNU = Valid Uninsured Non-Residential SRL property; MV = Mitigated Valid Insured Residential SRL property; MVU = Mitigated Valid Uninsured Residential SRL property; P = Pending Insured Residential SRL property; PN = Pending Insured Non-Residential SRL property; PU = Pending Uninsured Residential SRL property; PNU = Pending Uninsured Non-Residential SRL property*

Table 4.3.7-12. NFIP Policies, Claims, and Repetitive Loss Statistics

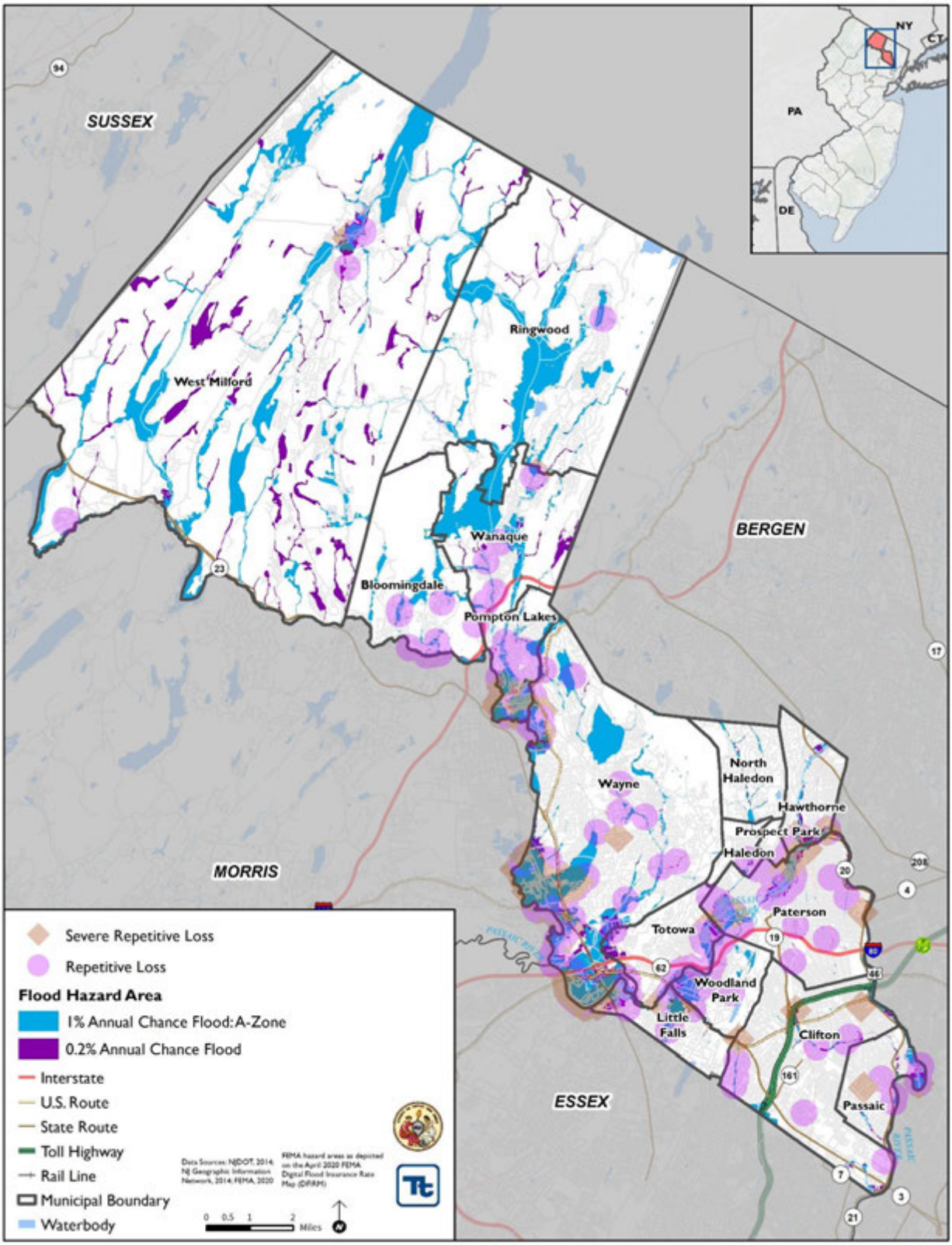
Municipality	NFIP Number of Policies	Write Your Own Number of Policies	Total Policies	NFIP Claims	Write Your Own Claims	Total Number of Claims	NFIP Payments	Write Your Own Payments	Total Loss Payments	Number of Repetitive Loss Properties (Excludes Severe Repetitive Loss Properties)	Number of Severe Repetitive Loss Properties (Valid Only*, Excludes Repetitive Loss Properties)	Total Repetitive Loss Properties and Severe Repetitive Loss Properties	Yes (Number of Mitigated Properties) / No (Number of Properties That Are Not Mitigated)
Bloomingdale, Borough of	8	47	55	28	55	83	$146,395	$1,027,697	$1,174,092	13	0	13	Yes (0) / No (13)
Clifton, City of	10	120	130	57	68	125	$430,541	$2,094,756	$2,525,297	7	2	9	Yes (0) / No (9)
Haledon, Borough of	2	6	8	23	15	38	$118,288	$32,990	$151,278	1	0	1	Yes (0) / No (1)
Hawthorne, Borough of	8	45	53	153	115	268	$1,680,634	$2,221,539	$3,902,173	17	4	21	Yes (0) / No (21)
Little Falls, Township of	96	376	472	584	1,141	1,725	$10,998,341	$23,451,867	$34,450,208	135	133	268	Yes (57) / No (211)
North Haledon, Borough of	4	26	30	4	9	13	$8,898	$37,383	$46,281	0	0	0	Yes (0) / No (0)
Passaic, City of	14	102	116	40	79	119	$2,161,259	$8,416,156	$10,577,415	10	1	11	Yes (0) / No (11)
Paterson, City of	72	757	829	373	850	1,223	$10,685,871	$26,059,192	$36,745,063	155	40	195	Yes (0) / No (195)
Pompton Lakes, Borough of	166	325	491	1,196	1,323	2,519	$24,035,708	$29,040,511	$53,076,219	151	168	319	Yes (0) / No (0)
Prospect Park, Borough of	0	3	3	0	2	2	$0	$103,567	$103,567	0	0	0	Yes (62) / No (257)
Ringwood, Borough of	5	30	35	4	16	20	$305	$86,983	$87,288	2	0	2	Yes (0) / No (2)
Totowa, Borough of	41	177	218	125	369	494	$1,844,114	$4,652,363	$6,496,477	40	8	48	Yes (1) / No (47)
Wanaque, Borough of	5	35	40	11	32	43	$69,586	$351,598	$421,184	6	1	7	Yes (0) / No (7)
Wayne, Township of	238	470	708	3,423	2,800	6,223	$56,733,161	$63,038,211	$119,771,372	352	412	764	Yes (270) / No (494)
West Milford, Township of	17	83	100	62	59	121	$539,695	$1,294,152	$1,833,848	10	2	12	Yes (0) / No (12)
Woodland Park, Borough of	21	159	180	149	439	588	$1,691,211	$8,831,853	$10,523,064	89	11	100	Yes (1) / No (99)
Passaic County (Total)	**707**	**2,761**	**3,468**	**6,232**	**7,372**	**13,604**	**$111,144,008**	**$170,740,818**	**$281,884,826**	**988**	**782**	**1770**	**Yes (391) / No (1,379)**

Source: *FEMA Region 2 2019; NFIP Bureau of Statistical Agency 2018*
NFIP *National Flood Insurance Program*
1 - Policies, claims, repetitive loss, and severe repetitive loss statistics provided by FEMA Region 2, and are current as of April 26, 2019. The total number of repetitive loss properties includes the severe repetitive loss properties. The number of claims represents claims closed by April 26,2019.
2 - Total building and content losses from the claims file provided by FEMA Region 2.

FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility. A zero percentage denotes less than 1/100th percentage, and not zero damages or vulnerability, as may be the case.

**Valid means the Severe Repetitive Loss Indicator is equal to V, VN, VU, VNU, MV, and MVU. Repetitive Loss Properties include properties that have a Severe Repetitive Loss Indicator of P, PU, PNU, and are left blank. V = Valid Insured Residential SRL property; VN = Valid Insured Non-Residential SRL property; VU = Valid Uninsured Residential SRL property; VNU = Valid Uninsured Non-Residential SRL property; MV = Mitigated Valid Insured Residential SRL property; MVU = Mitigated Valid Uninsured Residential SRL property; P = Pending Insured Residential SRL property; PN = Pending Insured Non-Residential SRL property; PU = Pending Uninsured Residential SRL property; PNU = Pending Uninsured Non-Residential SRL property*

Figure 4.3.7-7. NFIP Repetitive Loss Areas – Passaic County



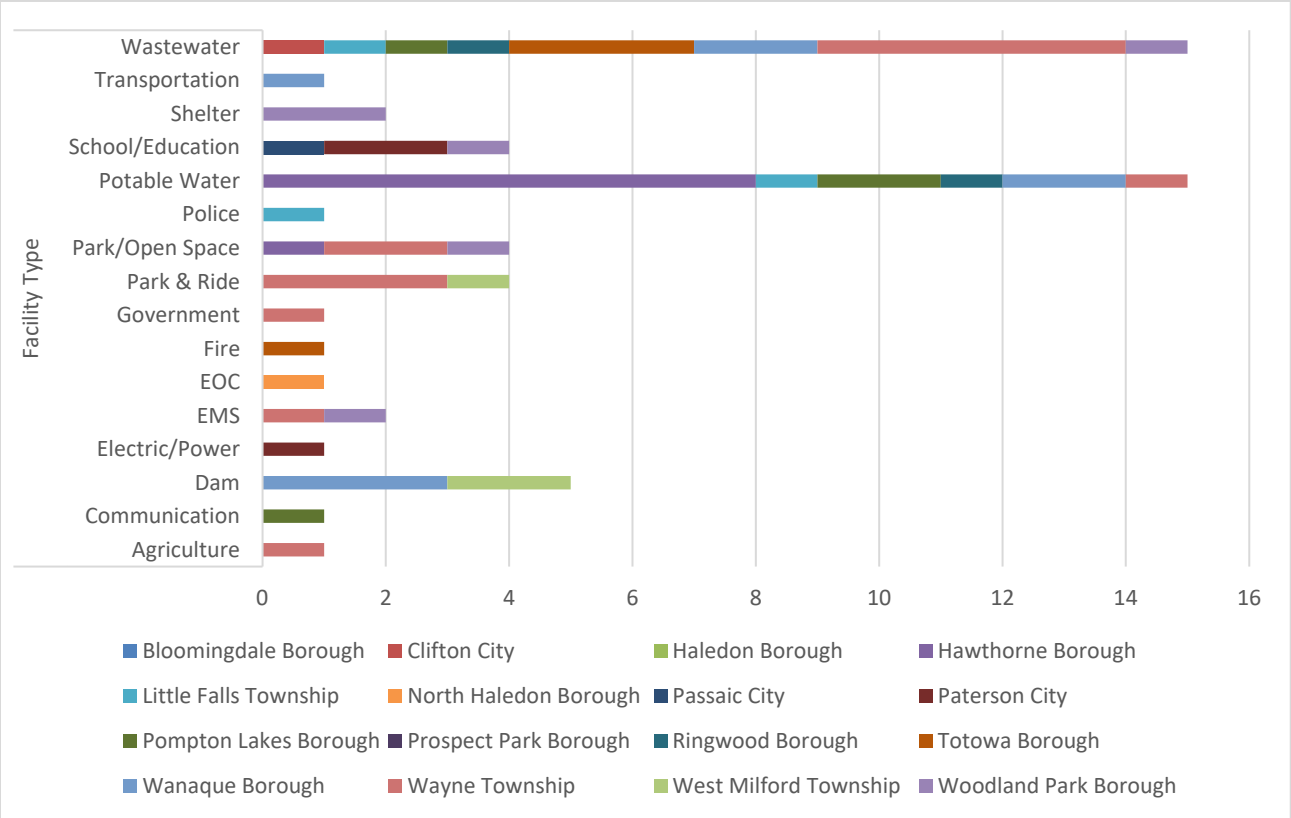
Impact on Critical Facilities

It is important to determine the critical facilities and infrastructure that may be at risk to flooding, and who may be impacted should damage occur. Critical services during and after a flood event may not be available if critical facilities are directly damaged or transportation routes to access these critical facilities are impacted. Roads that are blocked or damaged can isolate residents and can prevent access throughout the planning area to many service providers needing to reach vulnerable populations or to make repairs.

Critical facility exposure to the flood hazard was examined. Figure 4.3.7-8 and Figure 4.3.7-9 display the distribution of critical facilities in the 1- and 0.2-percent annual chance flood event boundaries. Of the 59 critical facilities located in the 1-percent annual chance flood event boundary, the greatest number are potable water and wastewater facilities. Furthermore, 32 of these critical facilities are considered lifelines for the County. Additionally, there are 94 critical facilities located in the 0.2-percent annual chance flood event boundary. 52 of the critical facilities are considered lifelines for the County. Majority of the critical facilities located in the 1-percent and 0.2-percent annual chance flood event boundaries are built in the Township of Wayne.

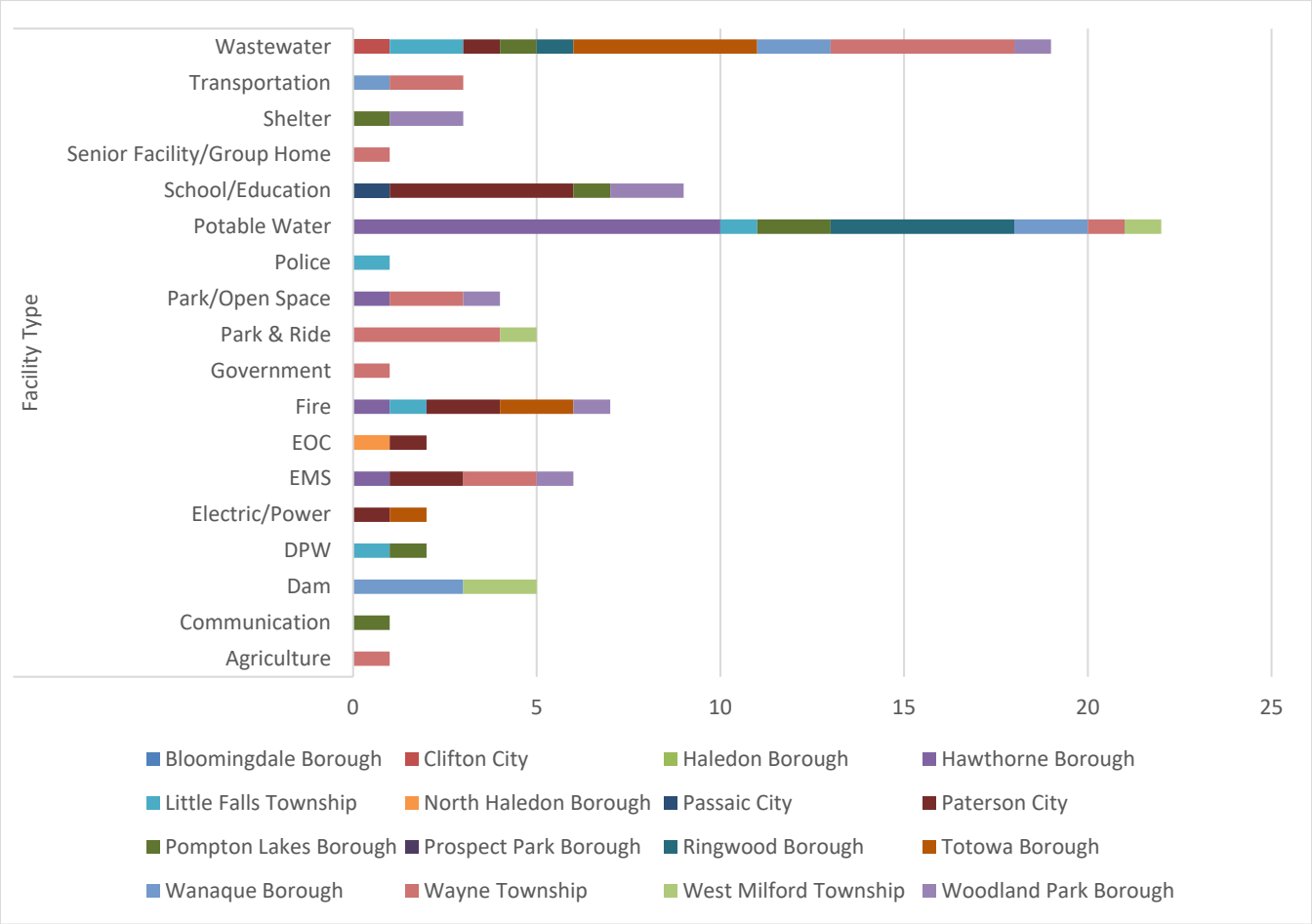
In cases where short-term functionality is impacted by flooding, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce flood impacts to critical facilities and ensure sufficient emergency and school services remain when a significant event occurs. Actions addressing shared services agreements are included in Section 9 (Mitigation Strategies) of this HMP update.

Figure 4.3.7-8. Distribution of Critical Facilities in the 1-Percent Annual Chance Flood Event Floodplain by Type and Municipality



% *Percent*
DPW *Department of Public Works*
EMS *Emergency Medical Services*
EOC *Emergency Operation Center*

Figure 4.3.7-9. Distribution of Critical Facilities in the 0.2-Percent Annual Chance Flood Event Floodplain by Type and Municipality



% *Percent*
DPW *Department of Public Works*
EMS *Emergency Medical Services*
EOC *Emergency Operation Center*

Impact on Economy

Flood events can significantly impact the local and regional economy. This includes but is not limited to general building stock damages and associated tax loss, impacts to utilities and infrastructure, business interruption, impacts on tourism, and impacts on the tax base to Passaic County. In areas that are directly flooded, renovations of commercial and industrial buildings may be necessary, disrupting associated services. Refer to the 'Impact on Buildings' subsection earlier which discusses direct impacts to buildings in Passaic County. Other economic components such as loss of facility use, functional downtime and socio-economic factors are less measurable with a high degree of certainty.

Flooding can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur and drinking water and wastewater treatment facilities may be temporarily out of operation.

Debris management may also be a large expense after a flood event. HAZUS-MH estimates the amount of debris generated from the 1-percent annual chance event. The model breaks down debris into three categories: (1) finishes (dry wall, insulation, etc.); (2) structural (wood, brick, etc.) and (3) foundations (concrete slab and block, rebar, etc.). The distinction is made because of the different types of equipment needed to handle the debris. Table 4.3.7-13 summarizes the debris HAZUS-MH 4.2 estimates for these events. As a result of the 1-percent annual chance event, HAZUS-MH 4.2 estimates approximately 63,408 tons of debris will be generated in total.

Table 4.3.7-13. Estimated Debris Generated from the 1% Annual Chance Flood Event

Municipality	1% Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Bloomingdale, Borough of	1,785	737	594	455
Clifton, City of	478	401	47	30
Haledon, Borough of	153	97	35	22
Hawthorne, Borough of	371	365	3	2
Little Falls, Township of	6,001	3,329	1,682	989
North Haledon, Borough of	298	287	7	5
Passaic, City of	1,418	800	359	259
Paterson, City of	10,442	6,665	2,332	1,445
Pompton Lakes, Borough of	3,397	3,100	180	117
Prospect Park, Borough of	53	36	10	6
Ringwood, Borough of	835	334	292	209
Totowa, Borough of	1,368	1,357	6	4
Wanaque, Borough of	1,628	603	613	412
Wayne, Township of	18,365	13,641	2,934	1,790
West Milford, Township of	7,190	1,650	3,285	2,255
Woodland Park, Borough of	9,626	3,264	3,809	2,553
Passaic County (Total)	**63,408**	**36,668**	**16,187**	**10,553**

Source: HAZUS-MH 4.2

In addition, an exposure analysis was conducted to determine how many miles of major highways may be impacted by flood events (refer to Table 4.3.7-14). These include Interstate 80, NJ Route 21, U.S. Route 46, Garden State Parkway, NJ Route 7, and NJ State Highway 23.

Table 4.3.7-14. Estimated Miles of Major Transportation Routes Exposed to 1% and 0.2% Flood Extents

Road Type	Total Miles in Passaic County	Exposure to Flood Hazard Area (Miles)			
		1-percent Annual Chance Flood	Percent (%) of Total	0.2-percent Annual Chance Flood	Percent (%) of Total
Highways	55.5	4.3	7.7%	7.5	13.5%

Source: Passaic County, FEMA 2020, NJDOT 2016

Impact on the Environment

Flood extents for the 1- and 0.2-percent annual flood events will continue to evolve alongside natural occurrences such as sea level rise, climate change, and/or severity of storms. These flood events will inevitably impact Passaic County's natural and local environment. Severe flooding not only influences the habitat of these natural land areas, it can be disruptive to species that reside in these natural habitats. Table 4.3.7-15 lists the number of acres exposed to the 1- and 0.2-percent annual chance flood extents by land use type. Non-residential land use types include forested and open space areas. Further, Table 4.3.7-16 lists the number of acres natural land use types within Passaic County that are at risk to flooding.

Table 4.3.7-15. Land Use Types in Passaic County Exposed to 1% and 0.2% Flood Extents

Land Use Type	Total Acres in Passaic County	Exposure to Flood Hazard Area (Acres)			
		1-percent Annual Chance Flood	Percent (%) of Total	0.2-percent Annual Chance Flood	Percent (%) of Total
Residential	28,343	2,533	8.9%	3,615	12.8%
Non- Residential	98,593	13,248	13.4%	16,296	16.5%
Total	126,936	15,781	12.4%	19,912	15.7%

Source: Passaic County, NLCD 2016, FEMA 2020

Table 4.3.7-16. Natural Environmental Areas Within the 1% and 0.2% Annual Chance Floodplains

Wetlands	Area in the 1-Percent Annual Chance Floodplain (acres)	Area in the 0.2-Percent Annual Chance Floodplain (acres)
Forest	1,275	3,338
Wetlands	3,276	7,892

Source: NJDEP 2017, NJDEP 2015, FEMA 2020

Future Changes That May Impact Vulnerability

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Passaic County falls within the North Atlantic Coast Comprehensive Study (NACCS) area, which established a plan to identify risk management strategies to mitigate future flood risks (USACE 2015). The NACCS was established shortly after Hurricane Sandy struck the north Atlantic states. As a result, a New York-New Jersey Harbor and Tributaries Coastal Storm Risk Management Report was created for vulnerable communities to address concerns identified by the NACCS (USACE 2019). This risk management report reviews different case studies to determine future risk and potential mitigation based on flood management designs for the New York Metropolitan Area and the six largest cities in New Jersey, which encompasses Passaic County. The designs range from no action to shoreline stabilization and storm surge barriers strategies. USACE is reviewing these alternatives to determine the best management strategy for reducing future flood risks (refer to Table 4.3.7-17).

One of the case studies being explored that is relevant to Passaic County is the USACE Passaic Tidal FRM Study, which focuses on reduction of flooding in the Lower Passaic River (USACE 2015). This project has a goal to reduce risk of tidal flood prone areas up to the 500-year flood event. To achieve this flood reduction, the project consists of 5.5 miles of levees and 5 miles of floodwalls. A feasibility study is underway by the Army Corp of Engineers to finalize the project design. The outcome of this project and the selected alternative listed by the NACCS may impact future development, changes in the population, and effects from climate change.

Table 4.3.7-17. Alternatives Suggested in the New York-New Jersey Harbor and Tributaries Coastal Storm Risk Management Report

Alt	Areas Benefited by Alternative	Areas Not Benefiting from Alternative	Main Environmental Concerns	Notes
1	None	Entire study area.	Entire study area remains as vulnerable as it will be with the currently ongoing efforts to coastal flooding impacts.	Assumes all ongoing studies/projects by USACE and funded efforts by others (e.g., RBD) are implemented to extent currently considered feasible/actionable.
2	Nearly all of the study area	Part of the eastern shorelines Bronx & Westchester Counties.	Tidal exchange in Hudson River Estuary, migration of estuary resources through Bight and Long Island Sound, cultural resources impacts.	Fewest number of alternative features (see Table 11).
3.a	Much of the study area	Shorelines around Raritan, Sandy Hook, and Lower Bay.	Tidal exchange in Hudson River Estuary, migration of estuary resources through Bight and LIS.	Addresses severe coastal storm risk in nearly all of NYC, inner NJ, and Hudson River. Relatively few alternative features.
3.b	Inland NJ areas (including port, oil terminals and Newark airport) and backside of SI by barrier, high risk areas of NJ & upstate NY along HR & NYC	Segments of NY (including NYC) and NJ (along HR) that initially appear to not have high risk/exposure.	Tidal exchange in Kills/Newark Bay, migration of estuary resources to Newark Bay, impacts to CERCLA-listed sites, impacts to cultural and social resources from perimeter measures in NJ along HR and NYC.	Only relatively higher risk areas in NY (including NYC) and NJ (along HR) have alternative features (Table 11).

Alt	Areas Benefited by Alternative	Areas Not Benefiting from Alternative	Main Environmental Concerns	Notes
4	Only relatively higher risk sections of shoreline or smaller tributary basins in study area.	Relatively moderate and low risk areas.	Tidal exchange in Hackensack River, Gowanus Canal, and Newtown Creek; CERCLA-listed sites; impacts to cultural and social resources from perimeter measures in NJ along HR and NYC.	Only relatively higher risk areas in NY (including NYC) and NJ have features. Major port facilities (incl. oil terminals, etc.), Newark and LaGuardia airports remain at risk. Many alternative features (Table 11).
5	Only relatively higher risk sections of shoreline or smaller tributary basins in study area.	Relatively moderate and low risk areas.	Coastal zone and wetland impacts to cultural and social resources from perimeter measures in NJ, upstate Hudson in NY, and NYC.	Only relatively higher risk areas in NY (including NYC) and NJ have features when feasible without in-water measures. Major facilities (including oil terminals etc.), Newark and LaGuardia airports remain at risk. Several alternative features (Table 11).

Source: USACE 2015 (Table 12)

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Passaic County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes).

An exposure analysis was conducted using the input from the communities as displayed in Figure 4.3.7-10 to determine if new development may be located in the floodplain. Based on the analysis, there are three potential new developments located in the 0.2-percent annual chance floodplain. The results of this analysis were shared with all jurisdictions. Being aware of these flood extents and requirements of protection will be critical for all future projects. The Passaic County Planning Board conducts site plan review for land development along County roads or areas affecting county drainage facilities and assesses if located in the floodplain. Further, a site plan review process is done at the municipal level to ensure compliance with local ordinances.

Projected Changes in Population

Passaic County has experienced population growth since 2010. According to the U.S. Census Bureau, the County's population has increased 1.9% between 2010 and 2018; a slower growth rate in comparison with the rest of New Jersey (U.S. Census Bureau 2020; Passaic County 2018). The Boroughs of Bloomingdale, Wanaque and Woodland Park have experienced the greatest percentage of growth since 2010; greater than 5% each.

As the climate changes with anticipated increases in rainfall frequency and intensity concurrent with population growth, there will be increased pressure on utility services and transportation infrastructure. Passaic County is experiencing urban flooding as discussed earlier in this section with numerous stormwater mitigation projects identified in Section 9. The County's draft Green Stormwater Infrastructure Element of the Passaic County Master Plan (2018) provides tools necessary to design, budget and implement green infrastructure through the County's development review process, capital projects and as a resource to municipalities. Passaic County's Engineering Department has been and continues to upgrade stormwater infrastructure while performing roadwork. As summarized in Section 6 (Mitigation Strategy), a new goal of the HMP is to encourage the use of

green infrastructure in an effort to reduce flooding through the use of green infrastructure. Further a Low Impact Development/Green Stormwater Infrastructure implementation plan is identified as a new mitigation action by the County; refer to Section 9.1 (Passaic County annex).

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to increase the risk to flash flooding and riverine flooding, and flood critical transportation corridors and infrastructure. Increases in precipitation may alter and expand the floodplain boundaries and runoff patterns, resulting in the exposure of populations, buildings, critical facilities and infrastructure that were previously outside the floodplain. This increase in exposure would result in an increased risk to life and health, an increase in structural losses, a diversion of additional resources to response and recovery efforts, and an increase in business closures affected by future flooding events due to loss of service or access.

The North Jersey Transportation Planning Authority (NJTPA) recently completed the Passaic River Basin Climate Resilience Planning Study (2019) which assessed the potential for increasingly severe and frequent storm and heat events along with rising sea levels in the Passaic River Basin. The riverine and coastal spatial data generated as a result of this study (25- and 100-year precipitation events for today and planning horizons 2045 and 2080) were used to help understand the change in building exposure as the climate changes. Table 4.3.7-18 through Table 4.3.7-20 summarizes the number of buildings, critical facilities, and population exposed to future projected flood inundation extents, respectively. It is important to note that only the existing 100-year precipitation event in the Passaic River Basin was included in this analysis; not the entire 1-percent annual chance floodplain modeled for this HMP. As summarized in the tables, the climate models anticipate an increase in flood inundation extents in 2045 and 2080 for the 25- and 100-year precipitation events, respectively, leading to an increase in number of buildings and persons exposed.

Table 4.3.7-18. Estimated General Building Stock Exposure to the Existing and Projected 25- and 100-year Precipitation Events

Jurisdiction	25-year Event		100-year		
	Current	2045	Current	2045	2080
Clifton, City of	3	3	3	12	28
Hawthorne, Borough of	15	19	37	68	173
Little Falls, Township of	388	413	490	677	1,425
Passaic, City of	4	37	76	218	465
Paterson, City of	541	694	1,120	1,681	3,783
Prospect Park, Borough of	0	0	3	4	9
Totowa, Borough of	231	278	374	510	1,062
Wayne, Township of	201	212	236	263	545
Woodland Park, Borough of	188	246	382	583	1,206
Building Totals	**1,571**	**1,902**	**2,721**	**4,016**	**8,696**

Source: NJTPA 2019

Table 4.3.7-19. Estimated Critical Facility Exposure to the Existing and Projected 25- and 100-year Precipitation Events

Jurisdiction	25-year Total Exposure				100-year Total Exposure					
	Existing	Existing (Lifelines Only)	2045	2045 (Lifelines Only)	Existing	Existing (Lifelines Only)	2045	2045 (Lifelines Only)	2080	2080 (Lifelines Only)
Clifton, City of	0	0	1	0	1	0	0	0	2	0
Hawthorne, Borough of	0	0	1	1	3	3	0	0	8	6
Little Falls, Township of	1	1	1	1	1	1	0	0	5	5
Passaic, City of	0	0	1	0	1	0	0	0	2	0
Paterson, City of	2	0	3	0	4	0	0	0	23	10
Totowa, Borough of	3	3	4	4	4	4	0	0	11	10
Wayne, Township of	2	1	2	1	2	1	0	0	4	2
Woodland Park, Borough of	3	0	4	0	4	0	0	0	14	0
Critical Facilities Totals	**11**	**5**	**17**	**7**	**20**	**9**	**0**	**0**	**69**	**33**

Source: NJTPA 2019

Table 4.3.7-20. Estimated Population Exposed to the Existing and Projected 25- and 100-year Precipitation Events

Jurisdiction	25-year		100-year		
	Existing Total	2045 Total	Existing Total	2045 Total	2080 Total
Hawthorne, Borough of	5	8	21	37	96
Little Falls, Township of	339	359	421	565	1,185
Passaic, City of	1	21	48	137	294
Paterson, City of	373	481	784	1,178	2,650
Prospect Park, Borough of	0	0	1	2	4
Totowa, Borough of	212	253	341	465	970
Wayne, Township of	164	169	183	198	413
Woodland Park, Borough of	138	188	299	463	963
County Population Total	**1,232**	**1,479**	**2,098**	**3,045**	**6,575**

Source: NJTPA 2019

Change of Vulnerability Since 2015 HMP

Since the 2015 analysis, population statistics have been updated using the 2013-2017 American Community Survey. The general building stock was also updated using RS Means 2019 building valuations that estimated replacement cost value for each building in the inventory rather than the 2013 tax assessor improvement value. This provides an up-to-date look at the entire building stock for Passaic County and gives more accurate results for the exposure and loss estimation analysis.

In addition, an updated DFIRM, effective April 2020, was released and included in this analysis. FEMA's HAZUS-MH flood module (version 4.2) and updated 1-percent annual chance flood event depth grid were used to estimate potential losses for the 1-percent annual chance flood event. As discussed earlier in this section, there have been increases and decreases in floodplain area throughout the County as a result of the updated FEMA DFIRMs. When comparing the exposure of structures to the flood hazard using the 2007 DFIRMs and the 2020 DFIRMs, there are also increases and decreases in the number of buildings in the flood zone; refer to Table 4.3.7-21. The updated building inventory generated for this plan was used to conduct this analysis. Overall, the City of Paterson has seen the greatest increase in the number of structures and residents in the floodplain with the release of the 2020 FEMA DFIRM.

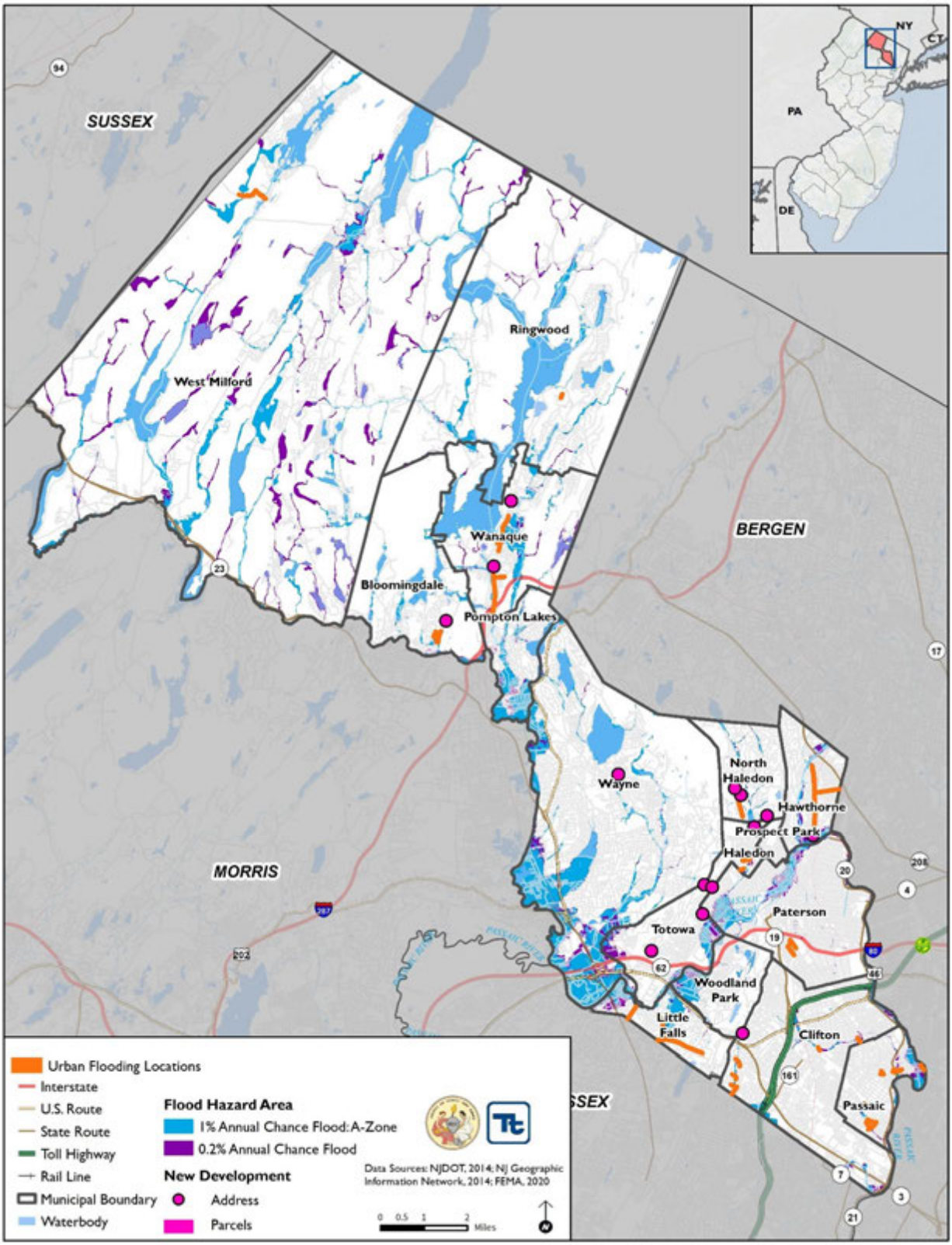
Table 4.3.7-21. Changes in Structure Vulnerability to the Flood Hazard Comparing the 2007 FEMA DFIRMS to the 2020 FEMA DFIRMs

Municipality	2007 FEMA DFIRM (Number of Buildings)		2020 FEMA DFIRM (Number of Buildings)		Change in Number of Buildings	
	1 % Annual Chance	0.2 % Annual Chance	1 % Annual Chance	0.2 % Annual Chance	1 % Annual Chance	0.2 % Annual Chance
Bloomingdale, Borough of	238	257	77	111	-161	-146
Clifton, City of	73	254	61	217	-12	-37
Haledon, Borough of	2	43	2	42	0	-1
Hawthorne, Borough of	81	161	81	141	0	-20
Little Falls, Township of	645	859	674	920	29	61
North Haledon, Borough of	21	34	30	43	9	9
Passaic, City of	110	248	67	269	-43	21
Paterson, City of	1,000	2,378	1,220	2,035	220	-343
Pompton Lakes, Borough of	729	1,153	797	1,030	68	-123
Prospect Park, Borough of	5	21	2	19	-3	-2
Ringwood, Borough of	37	60	35	52	-2	-8
Totowa, Borough of	375	589	373	543	-2	-46
Wanaque, Borough of	59	81	81	104	22	23
Wayne, Township of	1,363	1,573	1,252	1,442	-111	-131
West Milford, Township of	160	338	151	323	-9	-15
Woodland Park, Borough of	324	645	392	615	68	-30
Passaic County (Total)	**5,222**	**8,694**	**5,295**	**7,906**	**73**	**-788**

Source: FEMA 2007; FEMA 2020; Passaic County 2019

Since the 2015 HMP, several mitigation projects have been implemented in the County as summarized in Table 14 in each of the jurisdictional annexes (e.g., Wayne has acquisitions in progress; Pompton Lakes has both acquired and elevated homes). Overall, hundreds of RL and SRL properties have been mitigated with more in progress and identified in the updated mitigation strategy of this plan. Passaic County and all municipalities are making progress on reducing their flood risk; however still remain vulnerable to the hazard.

Figure 4.3.7-10. Potential New Development and Flood Boundaries



4.3.8 Geological Hazards

The following section provides the hazard profile and vulnerability assessment for the geological hazards in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2014 and 2019.
- Updated New Jersey Geological Survey and Water landslide susceptibility data (2016) was utilized for the risk assessment.

4.3.8.1 Profile

Hazard Description

Landslides

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors (USGS 2013). Among the contributing factors are: (1) erosion by rivers, glaciers, or ocean waves which create over-steepened slopes; (2) rock and soil slopes weakened through saturation by snowmelt or heavy rains; (3) earthquakes which create stresses making weak slopes fail; and (4) excess weight from rain/snow accumulation, rock/ore stockpiling, waste piles, or man-made structures. Scientists from the USGS also monitor stream flow, noting changes in sediment load in rivers and streams that may result from landslides. All of these types of landslides are considered aggregately in USGS landslide mapping.

In New Jersey, there are four main types of landslides: slumps, debris flows, rockfalls, and rockslides. Slumps are coherent masses that move downslope by rotational slip on surfaces that underlie and penetrate the landslide deposit (Briggs et al 1975). A debris flow, also known as a mudslide, is a form of rapid mass movement in which loose soil, rock, organic matter, air, and water mobilize as slurry that flows downslope. Debris flows are often caused by intense surface water from heavy precipitation or rapid snow melt. This precipitation loosens surface matter, thus triggering the slide. Rockfalls are common on roadway cuts and steep cliffs. These landslides are abrupt movements of geological material such as rocks and boulders. Rockfalls happen when these materials become detached. Rockslides are the movement of newly detached segments of bedrock sliding on bedrock, joint, or fault surfaces (Delano and Wilshusen 2001).

Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors that include:

- Erosion by rivers, glaciers, or ocean waves create over-steepened slopes
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains
- Earthquakes create stresses that make weak slopes fail
- Earthquakes of magnitude 4.0 and greater have been known to trigger landslides
- Volcanic eruptions produce loose ash deposits, heavy rain, and debris flows
- Excess weight from accumulation of rain or snow or stockpiling of rock or ore, from waste piles or man-made structures may stress weak slopes to failure (USGS 2013).

Landslides may be triggered by both natural and human-caused changes in the environment. Warning signs for landslide activity include:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavement, or sidewalk
- Soil moving away from foundations
- Ancillary structures, such as decks and patios, tilting and moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls, or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity
- Sudden increase in creek water levels while rain is still falling or just recently ended
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together (USGS 2013).

Subsidence/Sinkholes

Land subsidence can be defined as the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal motion, owing to the subsurface movement of earth materials (USGS 2000). Subsidence often occurs through the loss of subsurface support in karst terrain, which may result from a number of natural- and human-caused occurrences. Karst describes a distinctive topography that indicates dissolution of underlying carbonate rocks (limestone and dolomite) by surface water or groundwater over time. The dissolution process causes surface depressions and the development of sinkholes, sinking stream, enlarged bedrock fractures, caves, and underground streams (NJOEM 2019).

Sinkholes, the type of subsidence most frequently seen in the New Jersey, are a natural and common geologic feature in areas with underlying limestone, carbonate rock, salt beds, or other rocks that are soluble in water. Over periods of time, measured in thousands of years, the carbonate bedrock can be dissolved through acidic rain water moving in fractures or cracks in the bedrock. This creates larger openings in the rock through which water and overlying soil materials will travel. Over time the voids will enlarge until the roof over the void is unable to support the land above will collapse forming a sinkhole. In this example the sinkhole occurs naturally, but in other cases the root causes of a sinkhole are anthropogenic. These anthropogenic causes can include those that involve changes to the water balance of an area such as: over-withdrawal of groundwater; diverting surface water from a large area and concentrating it in a single point; artificially creating ponds of surface water; and drilling new water wells. These actions can serve to accelerate the natural processes of creation of soil voids, which can have a direct impact on sinkhole creation (NJOEM 2019).

Both natural and man-made sinkholes can occur without warning. Slumping or falling fence posts, trees, or foundations, sudden formation of small ponds, wilting vegetation, discolored well water, and/or structural cracks in walls and floors, are all specific signs that a sinkhole is forming. Sinkholes can range in form from steep-walled holes, to bowl, or cone-shaped depressions. When sinkholes occur in developed areas, they can cause severe property damage, disruption of utilities, damage to roadways, injury, and loss of life (NJOEM 2019).

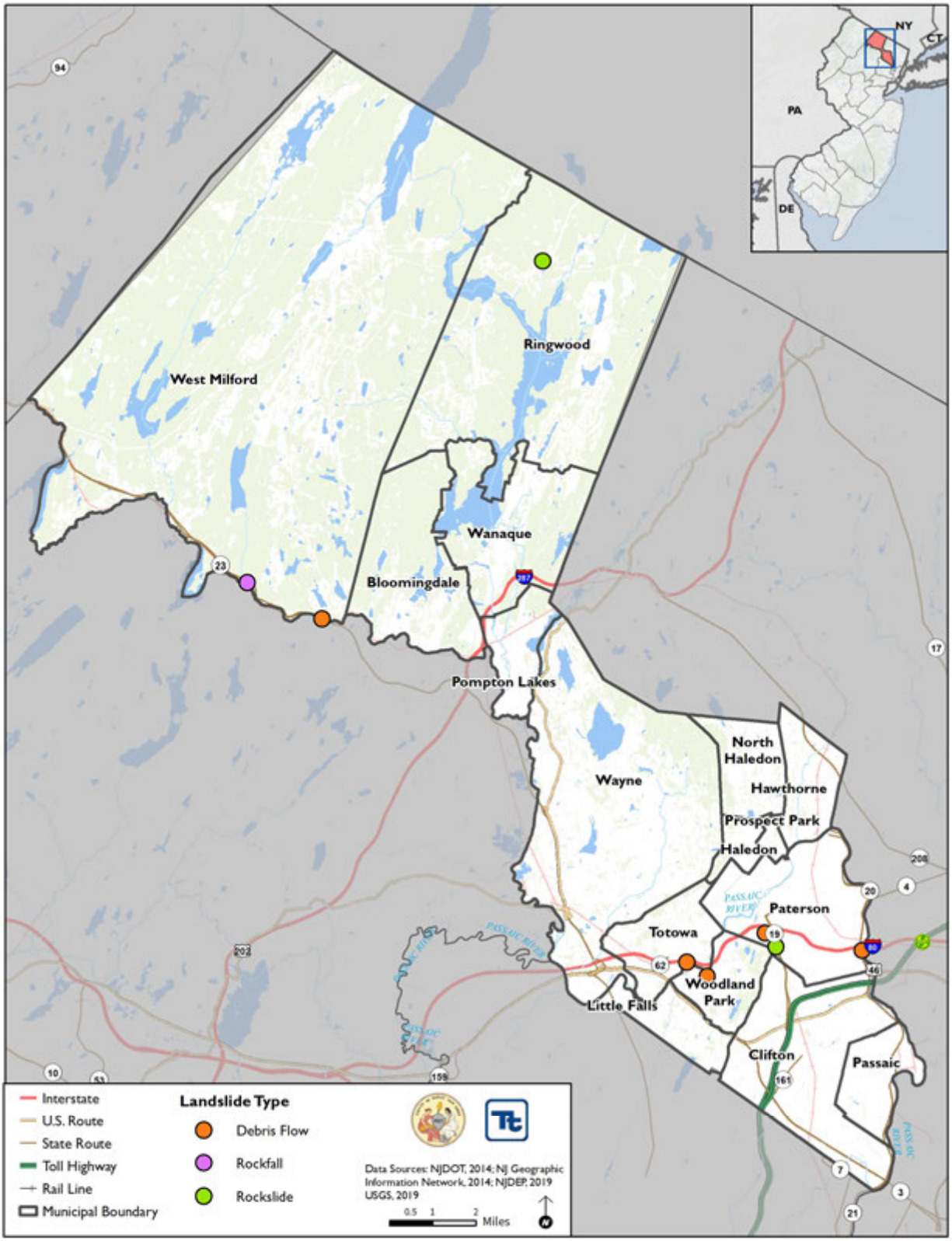
Location

Landslides

Within Passaic County, the highest elevations at approximately 1,480 feet to 1,500 feet above sea level are found at Bearfort Ridge at Bearfort Mountain in West Milford. Elevations decrease to around 20 feet above sea level along the Passaic River near Clifton (peakbagger 2020).

Landslides are common in New Jersey, primarily in the northern region of the state. In Passaic County, the area most susceptible to landslides is concentrated near the center and southeastern portion of the county. With the exception of the far southeastern area, the majority of southeast Passaic County has high landslide susceptibility with moderate incidence. The central portion of the county has moderate landslide susceptibility with low incidence. The remainder of the county has a low susceptibility. Figure 4.3.8-1 illustrates the historic landslide locations in Passaic County. According to the figure, landslide incidents have occurred throughout the county. A rockfall and debris flow have been reported in the Township of West Milford, a mudslide in the Borough of Ringwood, debris flows in the Boroughs of Totowa and Woodland Park, and a rockslide and debris flow in the City of Paterson.

Figure 4.3.8-1. Historic Landslide Locations in Passaic County, 1903 – June 2014



The New Jersey Geologic Survey (currently known as the NJGWS) determined landslide susceptibility for nine counties in New Jersey (Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union). Areas within these counties are classified into Class A, B, and C landslide susceptible classes, and several subclasses within these main classifications. These classes are consistent with HAZUS User Manual Table 9.2. Class A areas in Passaic County include dry geological groups consisting of strongly cemented rock Classes AI, AII, and AIV. These Class A areas range in landslide susceptibility starting at slope angles of 15 to 20 degrees, up to 30 to 40 degrees. Class B soils in Passaic County consist of the dry, weakly cemented rocks and soils, i.e., sandy soils and poorly cemented sandstone, including Classes BIII, BIV, and BV. Class BV may also contain wet, weakly cemented rocks and soils. Class B dry soils are susceptible to landsliding at slopes as low as 10 to 15 degrees up to 20 to 30 degrees. Class B wet soils are susceptible to landsliding at slopes as low as 0 to 10 degrees. The HAZUS User Manual also shows that there are Class C soil types, which include Classes CV, CVI, CVII, CIX, and CX. Class C soils have the greatest landslide susceptibility, consisting of shales, clayey soil, poorly compacted fills, and existing landslides. Landslide susceptibility data from NJGWS shows there are no class C soils in Passaic County.

Figure 4.3.8-2 shows the landslide susceptibility in Passaic County. There are small areas throughout the County with Class A and Class B landslide susceptibility. Table 4.3.8-1 summarizes the area within each class. In total, 3,992 acres (3.1%) of the County is identified as having Class A landslide susceptibility, and 365 acres (0.3%) of the County is identified as having Class B landslide susceptibility. Figure 4.3.8-3 shows the USGS U.S. Landslide Inventory interactive mapping tool output for Passaic County. The map shows the confidence of landslides to occur within the County.

Figure 4.3.8-2. Landslide Susceptibility in Passaic County

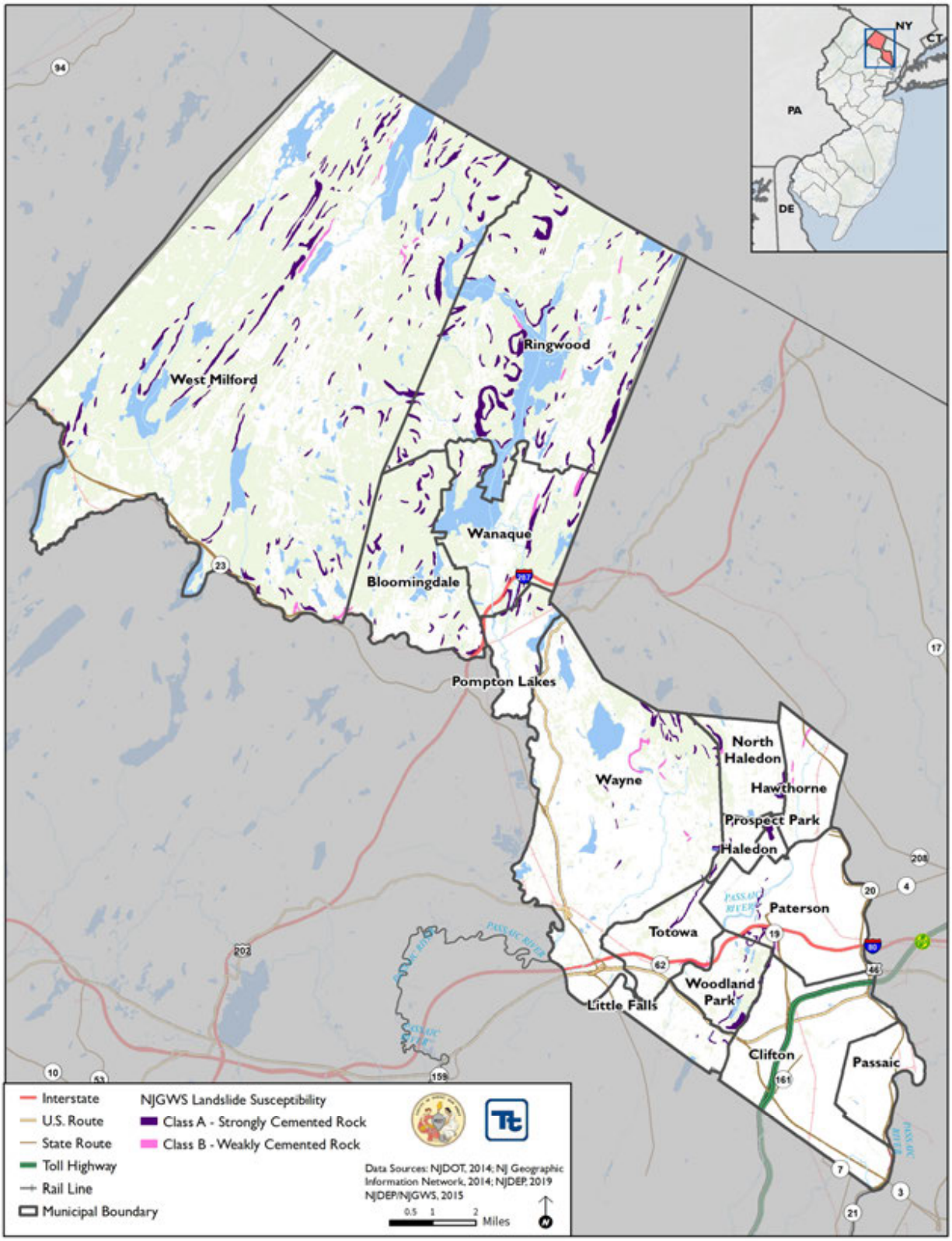


Table 4.3.8-1. Total Acres Located in the Landslide Susceptible Areas

Total Acres in Passaic County	Landslide Susceptible Soils	Total Acres of Landslide Susceptible Soils	Percent (%) Total
126,936	Class A	3,992	3.1%
	Class B	365	0.3%
	Total	**4,357**	**3.4%**

Source: Passaic County; NJDEP/NJGWS 2015; NLCD 2016

Notes:

% percent

sq mi square mile

NJGWS New Jersey Geological Water Survey

1 Total area includes land and water.

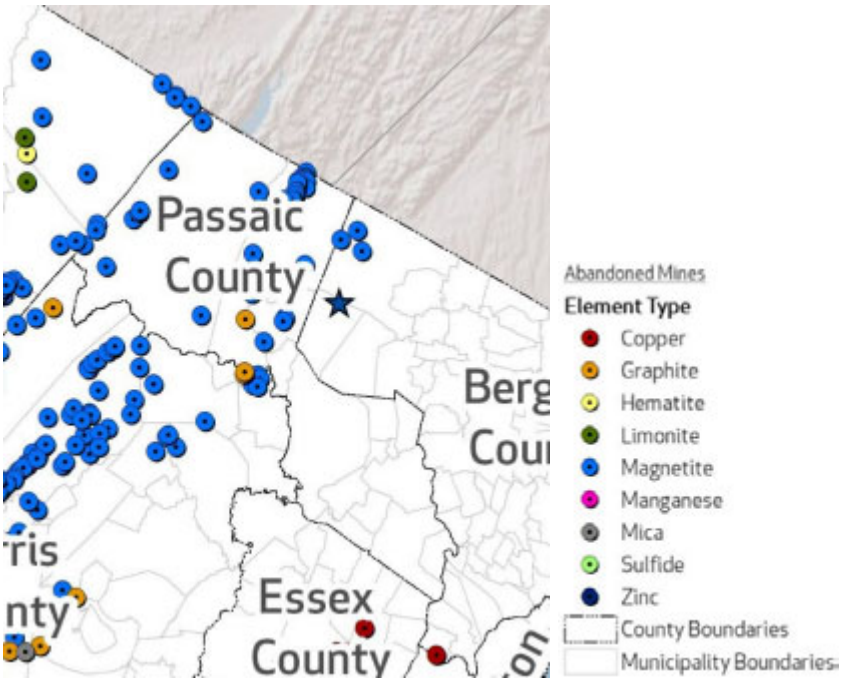
2 Class A includes Classes AII, AIV, AVI which is strongly cemented rock at varying slope angles. Class B includes Classes BIII, BIV, BV, and BVI which includes weakly cemented rock and soil at varying slope angles. No Class C soils types were identified in Passaic County.

Subsidence/Sinkholes

New Jersey is susceptible to the effects of subsidence and sinkholes, primarily in the northern region of the State. The State's susceptibility to subsidence is due in part to the number of abandoned mines throughout New Jersey. The State historically was an iron-producing state and the first mines in New Jersey were drilled in the early 1700s, with operations continuing until 1986 when the last active mine was closed. Although mines have closed in New Jersey, continued development in the northern part of the State has been problematic because of the extensive mining there which has caused widespread subsidence. One problem is that the mapped locations of some of the abandoned mines are not accurate. Another issue is that many of the surface openings were improperly filled in, and roads and structures have been built adjacent to or on top of these former mine sites.

Figure 4.3.8-3 illustrates the locations of the mapped abandoned mines in Passaic County. According to the New Jersey State Hazard Mitigation Plan these mines are magnetite, graphite and iron mines (NJHMP 2019).

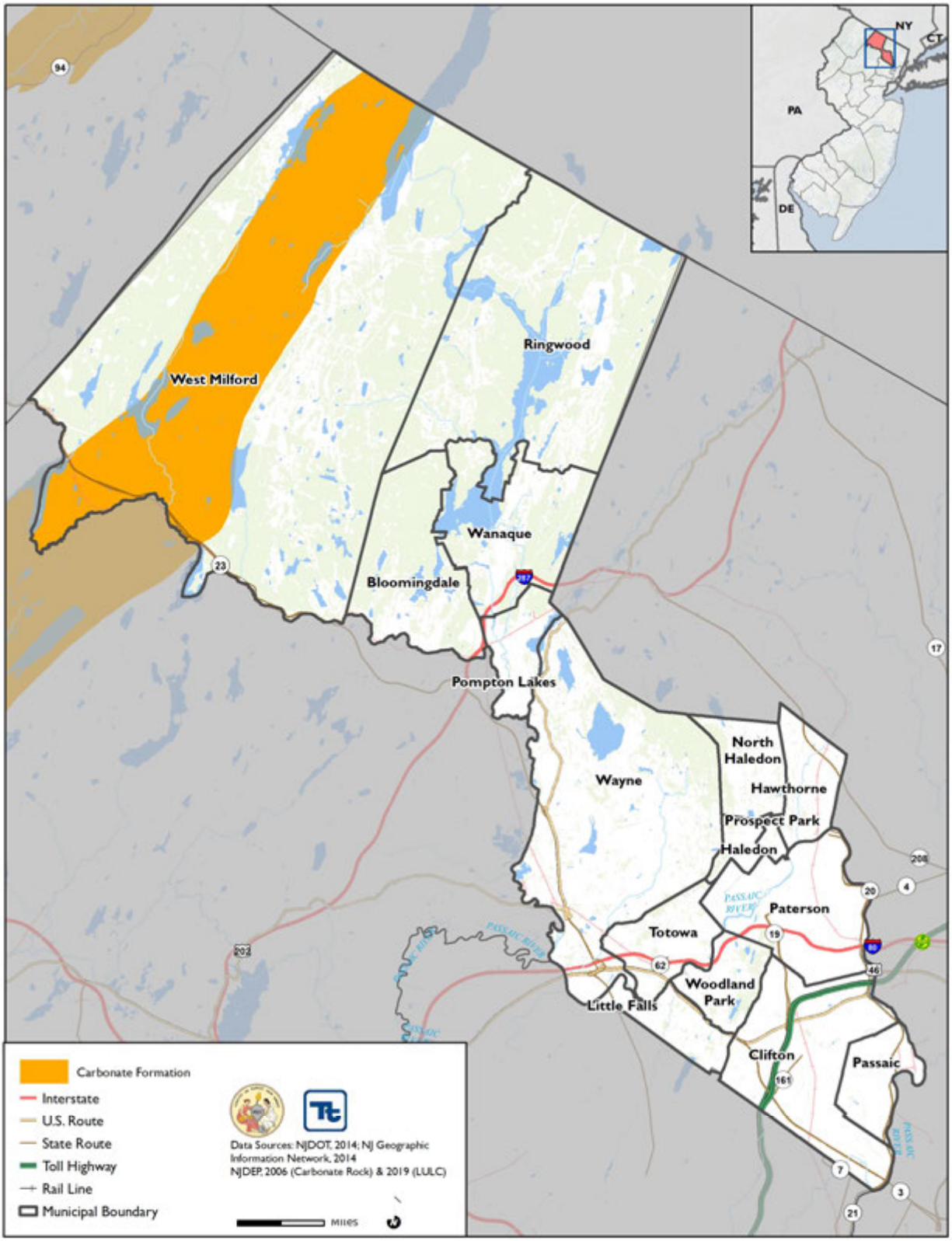
Figure 4.3.8-3. Abandoned Mines in Passaic County



Source: New Jersey State Hazard Mitigation Plan 2019

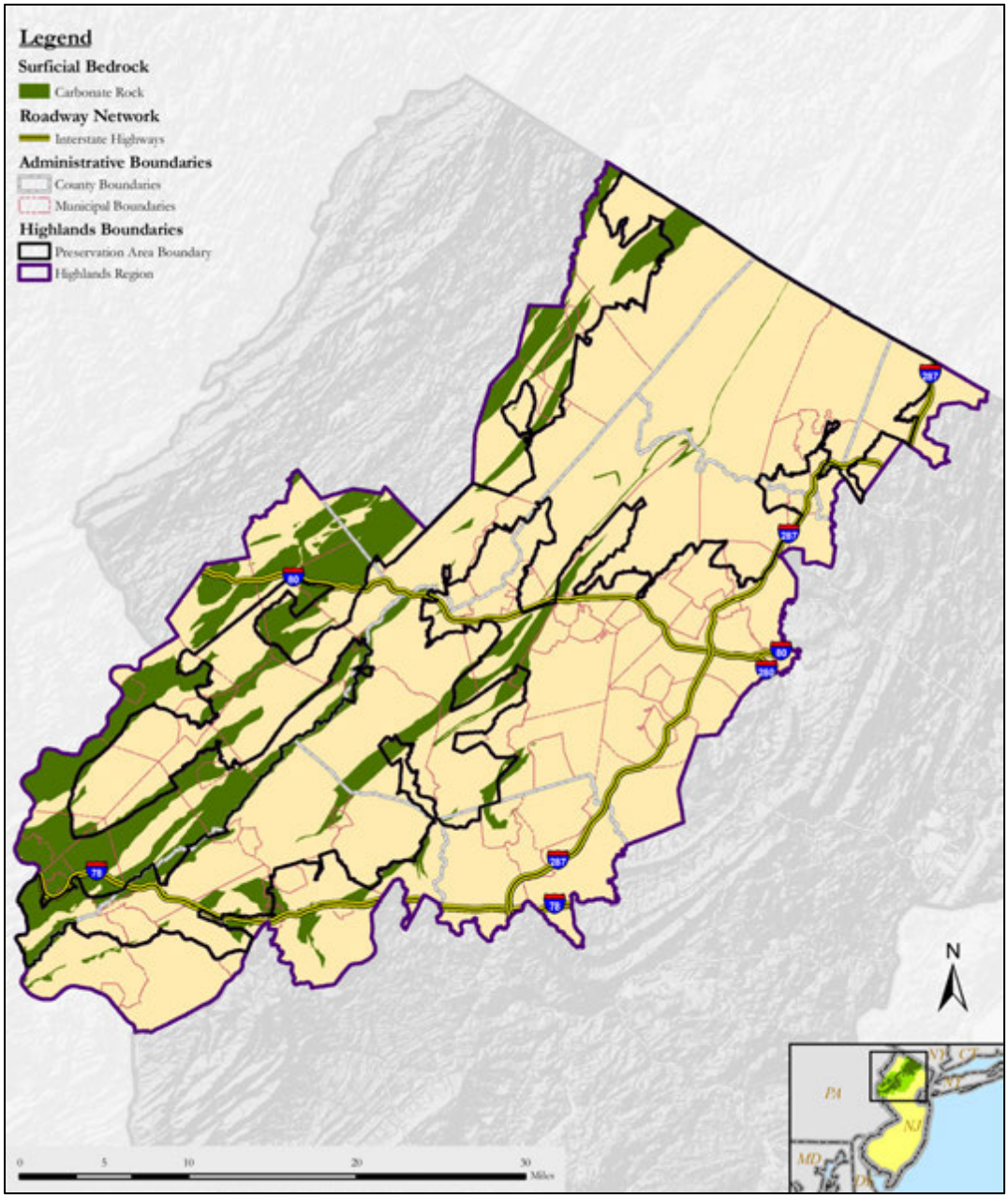
Figure 4.3.8-4 illustrates the locations of carbonate-bearing geologic formations in Passaic County. These formations are areas of potential natural subsidence. These geologic units contain a high enough percentage of carbonate minerals such as calcite and/or dolomite for karst features such as sinkholes to form. Some of these units are more prone to sinkhole development than others due to a greater carbonate content in the rock. Although not every unit listed has documented sinkholes, all are susceptible to dissolution by groundwater so various karst features, including sinkholes, may be found on any of these units. According to this figure, carbonate rock formations can be found in the Township of West Milford, and the Boroughs of Wanaque, Ringwood, and Bloomingdale.

Figure 4.3.8-4. Carbonate Rock Regions of New Jersey



Substantial areas of the New Jersey Highlands are underlain by carbonate rocks. These rock formations, consisting primarily of limestone, dolomite, and marble, have unique characteristics that require responses to both the policy level and in specific technical guidance to municipalities. According to the NJDEP, 59 of the 88 municipalities within the Highlands region contain carbonate rocks including four municipalities in Passaic County. Far from being an isolated geologic condition, the widespread presence of carbonate rocks in the regulated area indicates that their presence is a matter of regional concern.

Figure 4.3.8-5. Carbonate Rock in the New Jersey Highlands



Source: New Jersey Highlands Council 2007

Karst topography is a landscape created by groundwater dissolving underlying carbonate rocks, such as limestone and dolomite, by surface water or groundwater over time. This process causes surface depressions and develops sinkholes, sinking streams, enlarged bedrock fractures, caves, and underground streams (Highlands Regional Master Plan 2008).

Extent

Landslide

To determine the extent of a landslide hazard, the affected areas need to be identified and the probability of the landslide occurring within some time period needs to be assessed. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions and with reliable information. As a result, the landslide hazard is often represented by landslide incidence and/or susceptibility, as defined below:

- Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15% of a given area has been involved in landsliding; medium incidence means that 1.5 to 15% of an area has been involved; and low incidence means that less than 1.5% of an area has been involved (State of Alabama Date Unknown).
- Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility only identifies areas potentially affected and does not imply a time frame when a landslide might occur. High, medium, and low susceptibility are delimited by the same percentages used for classifying the incidence of landsliding (State of Alabama Date Unknown).

Subsidence/Sinkhole

Subsidence and sinkholes occur slowly and continuously over time or abruptly for various reasons. Subsidence and sinkholes can occur due to either natural processes (karst sinkholes in areas underlain by soluble bedrock) or as a result of human activities. Subsidence in the U.S. has directly affected more than 17,000 square miles in 45 states, and associated annual costs are estimated to be approximately $125 million. The principal causes of subsidence are aquifer-system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost (Galloway et al. 2000). There are several methods used to measure land subsidence. Global Positioning System (GPS) is a method used to monitor subsidence on a regional scale. Benchmarks (geodetic stations) are commonly space around four miles apart (State of California 2014).

Another method which is becoming increasingly popular is Interferometric Synthetic Aperture Radar (InSAR). InSAR is a remote sensing technique that uses radar signals to interpolate land surface elevation changes. It is a cost-effective solution for measuring land surface deformation for a region while offering a high degree of spatial detail and resolution (State of California 2014).

Previous Occurrences and Losses

Between 1954 and 2019, FEMA issued a DR or EM declaration for the State of New Jersey for one geological hazard-related event, classified as a mudslide. Passaic County was not included in this geological hazard-related declaration (FEMA 2020). Smaller-scale geologic events may occur throughout the County; however,

documentation of these events and associated impacts is not recorded in a central location to report additional events at this time.

Probability of Future Occurrences

Based upon risk factors for and past occurrences, it is likely that geological hazards will occur in Passaic County in the future. It is estimated that Passaic County will continue to experience direct and indirect impacts of geological hazards and its impacts on occasion, with the secondary effects causing potential disruption or damage to communities.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for geological hazards in the County is considered 'frequent'.

Climate Change Impacts

Future climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which could increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors could increase the probability for landslide occurrences.

Landslides

Both northern and southern New Jersey have become wetter over the past century. Northern New Jersey's 1971-2000 precipitation average was over 5 inches (12%) greater than the average from 1895-1970. (Office of New Jersey State Climatologist). Annual precipitation in New Jersey has been 8-percent above average during the last 10 years; and has experienced an upward trend of 4.1 inches in precipitation in 100-years (NJDEP 2019).

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Subsidence/Sinkholes

Similar to landslides, climate change will affect subsidence and sinkholes in New Jersey. As discussed throughout this profile, one of the triggers for subsidence and sinkholes is an abundance of moisture which has the potential to permeate the bedrock causing an event. Climatologists expect an increase in annual precipitation amounts. This increase will coincide with an increased risk in subsidence and sinkholes in vulnerable areas.

4.3.8.2 Vulnerability Assessment

For geological hazards, NJGWS landslide susceptibility areas have been identified as the hazard area. The following text summarizes the potential impact of geological hazards on the County. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess geological hazard risk.

Impact on Life, Health, and Safety

Generally, a landslide or subsidence event is an isolated incidence and impact the populations within the immediate area of the incident. Specifically, the population located downslope of the landslide hazard areas are particularly vulnerable. In addition to causing damages to residential buildings and displacing residents, landslides and subsidence events can block off or damage major roadways and inhibit travel for emergency responders or populations trying to evacuate the area.

Table 4.3.8-2 summarizes the population located in Class A and Class B landslide susceptible areas. The analysis shows that the City of Passaic has the greatest number of persons (i.e., 257 persons total) and the Borough of Haledon has the greatest percent of its population (i.e., 2.7%) located in the Class A hazard area. The Borough of Wanaque has the greatest number of persons and the greatest percent of its population located in the Class B hazard area (i.e., 142 total persons and 1.2%). Furthermore, naturally occurring subsidence and sinkholes in New Jersey occur within bands of carbonate bedrock. According to the NJGWS dataset, there is carbonate rock in the northern portion of the County. Approximately 38% of the population in the Township of West Milford resides on bands of carbonate bedrock.

Table 4.3.8-2. Estimated Population Located in the Landslide Hazard Areas

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed					
		Class A	% of Total	Class B	% of Total	Carbonate	% of Total
Bloomingdale, Borough of	8,139	10	0.1%	7	0.1%	0	0.0%
Clifton, City of	86,207	16	0.0%	0	0.0%	0	0.0%
Haledon, Borough of	8,440	230	2.7%	0	0.0%	0	0.0%
Hawthorne, Borough of	19,065	22	0.1%	82	0.4%	0	0.0%
Little Falls, Township of	14,524	0	0.0%	0	0.0%	0	0.0%
North Haledon, Borough of	8,564	54	0.6%	0	0.0%	0	0.0%
Passaic, City of	71,057	257	0.4%	0	0.0%	0	0.0%
Paterson, City of	147,890	38	0.0%	0	0.0%	0	0.0%
Pompton Lakes, Borough of	11,205	0	0.0%	0	0.0%	0	0.0%
Prospect Park, Borough of	5,955	0	0.0%	0	0.0%	0	0.0%
Ringwood, Borough of	12,451	0	0.0%	6	0.0%	0	0.0%
Totowa, Borough of	10,829	99	0.9%	3	0.0%	0	0.0%
Wanaque, Borough of	11,782	12	0.1%	142	1.2%	0	0.0%
Wayne, Township of	55,154	72	0.1%	121	0.2%	0	0.0%
West Milford, Township of	26,759	11	0.0%	96	0.4%	10,175	38.0%
Woodland Park, Borough of	12,542	62	0.5%	0	0.0%	0	0.0%

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed					
		Class A	% of Total	Class B	% of Total	Carbonate	% of Total
Passaic County (Total)	**510,562**	**882**	**0.2%**	**457**	**0.1%**	**0**	**0.0%**

Source: *American Community Survey 2017 5-Year Estimates; NJDEP/NJGWS 2015, NJDEP 2006*

Notes: *Class A includes Classes AII, AIV, AVI which is strongly cemented rock at varying slope angles. Class B includes Classes BIII, BIV, BV, and BVI which includes weakly cemented rock and soil at varying slope angles. No Class C soils were identified in Passaic County.*

% *percent*

NJGWS *New Jersey Geological and Water Survey*

Research has also shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. For example, persons over the age of 65 and people below the poverty level are most vulnerable to geologic hazards because of the potential limited access to mobilization or medical resources if a landslide or subsidence event occurs. According to the 2017 American Community Survey 5-Year Population Estimate, there are 69,429 persons over 65 years old and 86,667 persons below the poverty level out of the total 510,562 persons that live in Passaic County. Higher concentrations of persons over 65 years in age reside in the Borough of North Haledon (i.e., 24.2% of total population) and higher concentrations of persons below the poverty level reside in the City of Passaic (i.e., 33% of total population).

Impact on General Building Stock

In general, the built environment is vulnerable to landslide events if built on susceptible soils or downslope of Class A or Class B landslide susceptible soils. Landslides may destabilize the foundation of structures resulting in monetary losses to businesses and residents. There are 317 buildings with a replacement cost value of $222 million built on the Class A landslide susceptibility areas countywide. The Borough of Ringwood has the greatest number of buildings built on Class A soils; 71 buildings (1.6% of its total) with an estimated replacement cost of $44 million. The Township of West Milford has the greatest number of buildings built on Class B soils; 40 buildings (0.4% of its total) with an estimated replacement cost of $19 million. Table 4.3.8-3 and Table 4.3.8-4 summarize the number of buildings built on geologic hazard areas and the total replacement cost of these buildings by municipality, respectively.

Table 4.3.8-3. Number of Buildings Built on Geologic Hazard Areas by Municipality

Municipality	Number of Buildings	Estimated Building Stock Exposed					
		Number of Buildings - Class A	Percent (%) of Total	Number of Buildings - Class B	Percent (%) of Total	Number of Buildings - Carbonate	Percent (%) of Total
Bloomingdale, Borough of	2,611	4	0.2%	2	0.1%	0	0.0%
Clifton, City of	21,859	6	0.0%	0	0.0%	0	0.0%
Haledon, Borough of	1,809	56	3.1%	0	0.0%	0	0.0%
Hawthorne, Borough of	5,923	5	0.1%	26	0.4%	0	0.0%
Little Falls, Township of	3,412	0	0.0%	0	0.0%	0	0.0%
North Haledon, Borough of	2698	19	0.7%	0	0.0%	0	0.0%
Passaic, City of	6,918	0	0.0%	0	0.0%	0	0.0%
Paterson, City of	23,609	55	0.2%	0	0.0%	0	0.0%
Pompton Lakes, Borough of	3,081	9	0.3%	0	0.0%	0	0.0%
Prospect Park, Borough of	1,101	1	0.1%	0	0.0%	0	0.0%
Ringwood, Borough of	4,486	71	1.6%	3	0.1%	0	0.0%
Totowa, Borough of	3,771	33	0.9%	2	0.1%	0	0.0%
Wanaque, Borough of	3,157	5	0.2%	37	1.2%	0	0.0%
Wayne, Township of	17,646	25	0.1%	30	0.2%	0	0.0%
West Milford, Township of	10,794	9	0.1%	40	0.4%	4,117	38.1%
Woodland Park, Borough of	3,473	19	0.5%	0	0.0%	0	0.0%
Passaic County (Total)	**116,348**	**317**	**0.3%**	**140**	**0.1%**	**4,117**	**3.5%**

Sources: Microsoft, 2018, Open Street Map, 2019; NJOIT, 2018; NJDEP/NJGWS 2015, NJDEP 2006
Note: NJGWS New Jersey Geological Water Survey
Notes:
% Percent
< Less than

Class A includes Classes AII, AIV, AVI which is strongly cemented rock at varying slope angles. Class B includes Classes BIII, BIV, BV, and BVI which includes weakly cemented rock and soil at varying slope angles. No Class C soils were identified in Passaic County.

Table 4.3.8-4. Total Replacement Value of Structures Built on Geologic Hazard Areas by Municipality

Municipality	Total Replacement Cost Value (RCV)	Estimated Replacement Cost Value of Building Stock Exposed					
		RCV - Class A	Percent (%) of Total	RCV - Class B	Percent (%) of Total	RCV - Carbonate	Percent (%) of Total
Bloomingdale, Borough of	$1,784,142,939	$1,862,165	0.1%	$797,448	0.0%	$0	0.0%
Clifton, City of	$21,649,495,205	$33,675,323	0.2%	$0	0.0%	$0	0.0%
Haledon, Borough of	$1,708,591,489	$6,705,942	0.4%	$0	0.0%	$0	0.0%
Hawthorne, Borough of	$4,588,063,085	$4,137,136	0.1%	$20,815,563	0.5%	$0	0.0%
Little Falls, Township of	$4,633,701,650	$0	0.0%	$0	0.0%	$0	0.0%
North Haledon, Borough of	$2,317,277,271	$13,404,428	0.6%	$0	0.0%	$0	0.0%
Passaic, City of	$11,948,345,444	$0	0.0%	$0	0.0%	$0	0.0%
Paterson, City of	$55,984,762,201	$19,000,533	0.0%	$0	0.0%	$0	0.0%
Pompton Lakes, Borough of	$1,853,779,603	$11,176,642	0.6%	$0	0.0%	$0	0.0%
Prospect Park, Borough of	$709,318,581	$272,232	0.0%	$0	0.0%	$0	0.0%
Ringwood, Borough of	$2,724,021,483	$44,347,993	1.6%	$1,266,132	0.0%	$0	0.0%
Totowa, Borough of	$6,476,350,669	$29,484,336	0.5%	$8,176,859	0.1%	$0	0.0%
Wanaque, Borough of	$2,211,149,264	$6,592,467	0.3%	$16,062,365	0.7%	$0	0.0%
Wayne, Township of	$19,125,773,073	$18,524,402	0.1%	$22,160,253	0.1%	$0	0.0%
West Milford, Township of	$9,348,319,367	$14,057,844	0.2%	$19,365,186	0.2%	$3,063,309,095	32.8%
Woodland Park, Borough of	$17,134,672,551	$19,367,697	0.1%	$0	0.0%	$0	0.0%
Passaic County (Total)	**$164,197,763,874**	**$222,609,140**	**0.1%**	**$88,643,806**	**0.1%**	**$3,063,309,095**	**1.9%**

Sources: Microsoft, 2018, Open Street Map, 2019; RS Means 2019; NJOIT, 2018; NJDEP/NJGWS 2015, NJEP 2006
Note: NJGWS New Jersey Geological Water Survey
Notes:
% Percent
< Less than

Class A includes Classes AII, AIV, AVI which is strongly cemented rock at varying slope angles. Class B includes Classes BIII, BIV, BV, and BVI which includes weakly cemented rock and soil at varying slope angles. No Class C soils were identified in Passaic County.

Impact on Critical Facilities

To estimate potential risk to critical facilities, the geologic hazard areas were overlaid upon the inventory. There are three critical facilities built on Class A and Class B landslide susceptible soils. Two of these critical facilities are potable pump stations located in the Borough of Wanaque and Borough of Woodland Park and one critical facility is an airport/aviation facility located in the City of Clifton. The potable pump station in the Borough of Wanaque is considered a lifeline facility. Furthermore, 18 critical facilities reside on bands of carbonate rock in the Township of West Milford. 5 of those critical facilities are considered lifelines for the County. Facilities built on bands of carbonate rock include wells, airport/aviation facilities, potable treatment facilities, dams, schools, emergency management services, fire stations, libraries, and transportation facilities.

In addition to critical facilities, a significant amount of infrastructure can be exposed to mass movements of geological material:

- *Roads*—Access to major roads is crucial to life-safety after a disaster event and to response and recovery operations. Landslides can block egress and ingress on roads, causing isolation for neighborhoods, traffic problems, and delays for public and private transportation. This can result in economic losses for businesses.
- *Bridges*—Landslides can significantly impact road bridges. Mass movements can knock out bridge abutments or significantly weaken the soil supporting them, making them hazardous for use.
- *Power Lines*—Power lines are generally elevated above steep slopes; but the towers supporting them can be subject to landslides. A landslide could trigger failure of the soil underneath a tower, causing it to collapse and ripping down the lines. Power and communication failures due to landslides can create problems for vulnerable populations and businesses.
- *Rail Lines*—Similar to roads, rail lines are important for response and recovery operations after a disaster. Landslides can block travel along the rail lines, which would become especially troublesome, because it would not be as easy to detour a rail line as it is on a local road or highway. Many residents rely on public transport to get to work around the county and into New York City, and a landslide event could prevent travel to and from work.

Several other types of infrastructure may also be exposed to landslides, including water and sewer infrastructure. At this time, all critical facilities, infrastructure, and transportation corridors located within the hazard areas are considered vulnerable until more information becomes available.

Impact on the Economy

Geologic hazards can impose direct and indirect impacts on society. Direct costs include the actual damage sustained by buildings, property, and infrastructure due to ground failure, which also threatens transportation corridors, fuel and energy conduits, and communication lines (USGS 2005). Indirect costs, such as clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity may also occur, but are difficult to measure.

Buildings susceptible to landslide events were summarized earlier in this section. Losses to these structures will impact the local tax base and economy. Furthermore, there are 1.9 miles of highway located on landslide-susceptible soils; portions of Interstate 80 and NJ Route 21. Roads built and that traverse landslide susceptible areas may experience damages which may result in cascading transportation impacts to populations throughout the region

Impact on the Environment

A landslide or sinkhole/subsidence event will alter the landscape. In addition to changes in topography, vegetation and wildlife habitats may be damaged or destroyed, forest productivity can decline, or massive wasting and erosion of natural surfaces may occur causing soil and sediment runoff (USGS 2001). Soil and sediment runoff can accumulate downslope potentially blocking waterways and roadways and impacting quality of streams and other water bodies. Habitats stripped of fertile soils can delay the growth of new vegetation post-landslide event.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development and Population Changes

Any areas of growth could be potentially impacted by the geologic hazard if located within the identified hazard areas or downslope. In general, development of slopes is not recommended due to the increased risk of erosion, stormwater runoff and flooding potential. The additional runoff results in sedimentation of down slope surface waters, which damages habitat and has the potential to damage property.

As discussed in Section 3 and Volume II, Passaic County's population continues to grow and areas targeted for future growth and development have been identified. Of the new development identified by municipalities over the next five years, no development projects are planned to be built on landslide susceptible soils. Many municipalities have steep slope ordinances that prohibit development in these areas. Further, Planning Boards review the area and percentage of slope before approving an area for development (e.g., Borough of Bloomingdale). Therefore, the potential to develop these vulnerable areas is decreasing. However, existing buildings and infrastructure in these areas remain potentially vulnerable.

Climate Change

A direct impact of climate change on landslides is difficult to determine. Multiple secondary effects of climate change have the potential to increase the likelihood of landslides. Warming temperatures resulting in wildfires would reduce vegetative cover along steep slopes and destabilize the soils due to destruction of the root system; increased intensity of rainfall events would increase saturation of soils on steep slopes. Under these future conditions, the County's assets located on or at the base of these steep slopes will have an increased risk to landslides. Roadways and other transportation infrastructure located in these areas will also be at an increased risk of closure, which would impact the County's risk as described above .

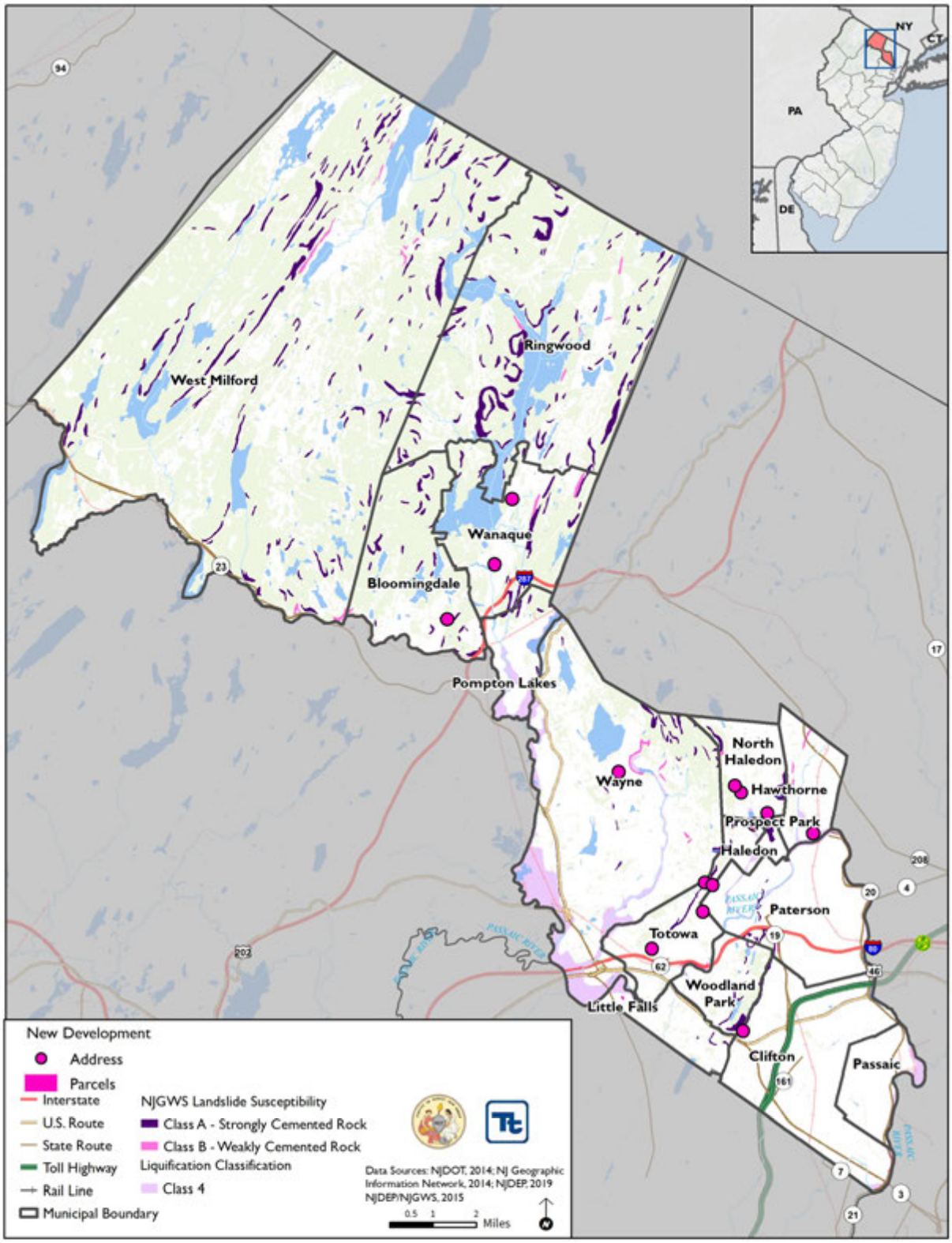
Higher temperatures and the possibility of more intense, less frequent summer rainfall may lead to changes in water resource availability. Increase in average temperatures may lead to an increase in the frequency of droughts. Sinkhole activity intensifies in some karst areas during periods of drought. With an increase in drought periods, the number of sinkholes can increase (Linares et al. 2016). Additionally, changes to the water balance of an area including over-withdrawal of groundwater, diverting surface water from a large area and concentrating it in a single point, artificially creating ponds of surface water, and drilling new water wells will cause sinkholes.

These actions can also serve to accelerate the natural processes of bedrock degradation, which can have a direct impact on sinkhole creation.

Vulnerability Changes Since the 2015 HMP

The entire County continues to be vulnerable to the landslide hazard. Several differences exist between the 2015 HMP and this update including updated hazard data and asset inventory data. As discussed in Section 4.2 (Methodology and Tools), an updated general building stock based upon replacement cost value from MODIV tax assessment data and 2019 RS Means, and an updated critical facility inventory were used to assess the County's risk to the identified hazards of concern. In addition, the 2017 American Community Survey population estimates were used and estimated at a structural level in place of the 2010 U.S. Census blocks. Updated hazard areas were used as well; since the 2015 HMP, the NJGWS has released updated landslide susceptibility data. The updated data was used for the exposure analysis and to update HAZUS-MH's default earthquake data. Overall, the hazard area delineations remained unchanged, so any signification increase in vulnerability would be attributed to population growth and new development.

Table 4.3.8-4. Potential New Development and Landslide Hazard Areas



4.3.9 Hazardous Materials Release

The following section provides the hazard profile and vulnerability assessment for the hazardous materials hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous events between 2014 and 2019 were researched, with a comprehensive list of previous events in Appendix E (Risk Assessment Supplement).

4.3.9.1 Profile

Hazard Description

Hazardous substances are substances that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). Many are commonly used substances which are harmless in their normal uses, but are quite dangerous if released. The Superfund law designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2020).

Superfund's definition of a hazardous substance includes the following:

- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of CERCLA.
- Any hazardous substance designated under section 311(b)(2)(a) of the Clean Water Act (CWA), or any toxic pollutant listed under section 307(a) of the CWA. There are over 400 substances designated as either hazardous or toxic under the CWA.
- Any hazardous waste having the characteristics identified or listed under section 3001 of the Resource Conservation and Recovery Act.
- Any hazardous air pollutant listed under section 112 of the Clean Air Act, as amended. There are over 200 substances listed as hazardous air pollutants under the Clean Air Act (CAA).
- Any imminently hazardous chemical substance or mixture which the EPA Administrator has "taken action under" section 7 of the Toxic Substances Control Act (USEPA 2020).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as the environment. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

Transportation of hazardous substances on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazard substance release incidents. New Jersey is composed of approximately 39,000 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation [NJDOT] 2019). In Passaic County there are approximately 247 miles of roadway. These roads cross rivers and streams at many points; hazardous substance spills on roads have the potential to pollute watersheds that serve as domestic water supplies for parts of the State. Potential also exists for hazardous substance releases to occur along rail lines as collisions and derailments of train cars can result in large spills.

Pipelines can also transport hazardous liquids and flammable substances such as natural gas and petroleum. Incidents can occur when pipes corrode, when they are damaged during excavation, incorrectly operated, or damaged by other forces. In New Jersey, most of the large pipeline leaks have been caused by marine traffic hitting or the anchors of ships effecting pipelines in the waterways. Additionally, hazardous substances can be transported by aircraft or by watercraft. Crashes, spills of materials, and fires on these vessels can pose a hazard.

The Passaic County Health Department is the lead agency for responding to hazardous materials emergencies by virtue of certification from the Department of Environmental Protection and by County Ordinance. The Health Department works in cooperation with local provider agencies, such as the County Sheriff and local fire departments. For detailed information regarding the duties of the Passaic County HAZMAT, see Section 5 (Capability Assessment).

Location

The following provides information regarding the location of hazardous substance incidents.

Hazardous Substances Fixed Site

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These types of substances are most often released as a result of transportation accidents or a chemical spill at a facility. Many products containing hazardous materials are also used and stored in homes.

In response to concerns regarding health and environmental risks, Congress established the Superfund program in 1980 to clean up these sites. The Superfund program is administered by the USEPA in cooperation with individual states. In New Jersey and Passaic County, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP 2020). There are two superfund sites remaining in Passaic County (NJOEM 2019); in the Borough of Ringwood and Township of Wayne.

In 2009, the Site Remediation Reform Act (SRRA) established the Licensed Site Remediation Professional (LSRP) program. This program has fundamentally changed the process for how sites are remediated in New Jersey, including Passaic County. In 2019, New Jersey Governor signed legislation to further improve the effectiveness of the program. At the end of 2019, the Site Remediation and Waste Management Program (SRWMP) reported 13,531 contaminated sites, and of these sites, 10,558 were active LSRP cases. From 2009 to 2019, more than 53,000 cases were closed (NJDEP 2020). There are 16 open remediation sites in Passaic County (NJDEP 2020).

The NJDEP maintains a list of Known Contaminated Sites of New Jersey (KCSNJ). It is an inventory that includes all sites in the State where contamination is known to exist. The remediation for these sites is currently active or pending in the NJDEP's Site Remediation Program (SRP). As of April 12, 2017, there are over 13,000 KCSNJ sites in New Jersey, with 820 of those sites in Passaic County (NJOEM 2019).

Federal regulations include the CERCLA and the Superfund Amendments and Reauthorization Act (SARA) required that a National Priorities List (NPL) of sites throughout the United States be maintained and revised at least annually (NJDEP 2013).

Fixed-site facilities that use, manufacture, or store hazardous substances in New Jersey pose risk and must comply with Title III of the federal SARA. SARA was signed into law on October 17, 1986. It is a federal law that applies nationwide. It must be realized that this law is linked to N.J.S.A. 34:5A, the New Jersey Worker and Community Right to Know Act. SARA requires the governor of each state to establish a State Emergency Response Commission (SERC). New Jersey's SERC was established by Executive Order on February 13, 1987. SARA also requires that the emergency planning districts be established by the SERC. The Act specified that

these districts can be existing political subdivisions. The function of the emergency planning district is to facilitate preparation and implementation of emergency plans. In New Jersey, all municipalities and counties have been designated emergency planning districts (total of 588). The Local Emergency Planning Committees (LEPC) is the policy body for the emergency planning district (New Jersey Division of Fire Safety 2011).

The State enacted the Toxic Catastrophe Prevention Act (TCPA), N.J.S.A. 13:1K-19 et seq. Currently, implementation of the requirements established under this Act is facilitated by the TCPA Program. Certain industrial facilities using materials considered extraordinarily hazardous must take steps to prevent releases and protect public safety. New Jersey has also mandated that facilities storing large quantities of hazardous substances take preventative measures to reduce the likelihood of a leak or discharge. Established under the New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), these requirements include testing and inspection of storage tanks, training of employees, and emergency response planning. The Discharge Prevention Containment and Countermeasure (DPCC) program facilitates implementation of these requirements. Regulations related to reporting of chemical and petroleum discharges are also administered under this program. The Program is sometimes referred to by the acronym DPCC, which refers to an important preparedness document that major facilities develop under the program (NJDEP 2018).

The Community Right to Know (CRTK) program collects, processes, and disseminates the chemical inventory, environmental release and materials accounting data required to be reported under the New Jersey Worker and Community Right to Know Act, N.J.S.A.34:5A and the federal Emergency Planning and Community Right to Know Act of 1986 (EPCRA). EPCRA is also known as Title III of the SARA. This information is used by the public, emergency planners, and first responders to determine the chemical hazards in the community (NJDEP 2014).

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. This report lists 29 facilities in Passaic County (U.S. EPA 2017).

The Right-to-Know Network

The Right-to-Know Network provides access to databases and resources on the environment. The databases include: Toxic Release Inventory (TRI), National Response Center Spills and Accidents (ERNS), Risk Management Plans (RMP), Hazardous Waste Biennial Reporting System (BRS), and Resource Conservation and Recovery Act Information System - violations and permits (RCRIS).

- Toxic Release Inventory (TRI) Database - TRI is a database of information about releases and transfers of toxic chemicals from facilities in certain industrial sectors, including manufacturing, waste handling, mining, and electricity generation. Facilities must also report the total amount of toxic chemicals in waste that they produce.
- National Response Center (NRC) Spills and Accidents database - the Spills and Accidents database contains data on toxic chemical spills and other accidents reported to the NRC. This database used to be called ERNS, the Emergency Response Notification System, and is still referred to as ERNS in many situations. Incidents reported to NRC range from minor to serious, from an oil-sheen on water to a release of thousands of gallons. NRC reports are extensive, but also known to be incomplete, as many incidents are never reported, and those that are reported generally are not subject to verification.
- Risk Management Plan (RMP) database - Federal law requires industrial facilities that use large amounts of extremely hazardous substances to file a RMP with the U.S. Environmental Protection Agency (EPA). These RMP data are intended to save lives, protect property, and prevent pollution. In particular, some industrial facilities are switching to safer and more secure chemicals that reduce the danger to employees

and surrounding communities. EPA does not release to the public some of the most important data in the RMP database; these data can only be obtained by going to a federal reading room.

- Biennial Reporting System (BRS) database – the BRS database contains data on the generation, shipment, and receipt of hazardous waste. BRS contains information from the Hazardous Waste Reports that must be filed every two years under the Resource Conservation and Recovery Act (RCRA), the Federal statute that regulates the generation, treatment, storage, disposal, or recycling of solid and hazardous waste.
- Resource Conservation and Recovery Act Information System (RCRIS) database – this database contains data on hazardous waste handler permits and activities. The RCRIS database, unlike many EPA databases, does not have "reporting years". It is a continuously updated set of data that includes records from the early years of RCRA through the present.

Hazardous Substances In-Transit

Incidents involving hazardous substances in transit can occur anywhere in the State. Figure 4.3.9-1 shows the major transportation routes and features in the County. Major highways include I-287, I-80 and the Garden State Parkway.

Hazardous substance incidents may also occur along railways in Passaic County. The NJDOT has a vital interest in preserving and improving the rail freight part of its transportation network. Rail shipments allow cost-effective movement of goods with less stress on the State's highway system. Major commodities shipped by rail entail petrochemicals (including plastic pellets), construction materials, food products, raw materials, and finished goods for manufacturers. Of concern for this hazard are rail cars carrying hazardous substances. An accident or release could pose a public safety hazard to the community.

Hazardous substances can also be transported via pipeline across the State. New Jersey has an extensive network of natural gas and petroleum pipelines. Several of the petroleum pipelines originate in the Gulf Coast region (Colonial Pipeline and Buckeye Pipeline). Figure 4.3.9-2 shows the extent and locations of pipelines throughout the northeastern United States.

Figure 4.3.9-1. Major Transportation Features in Passaic County

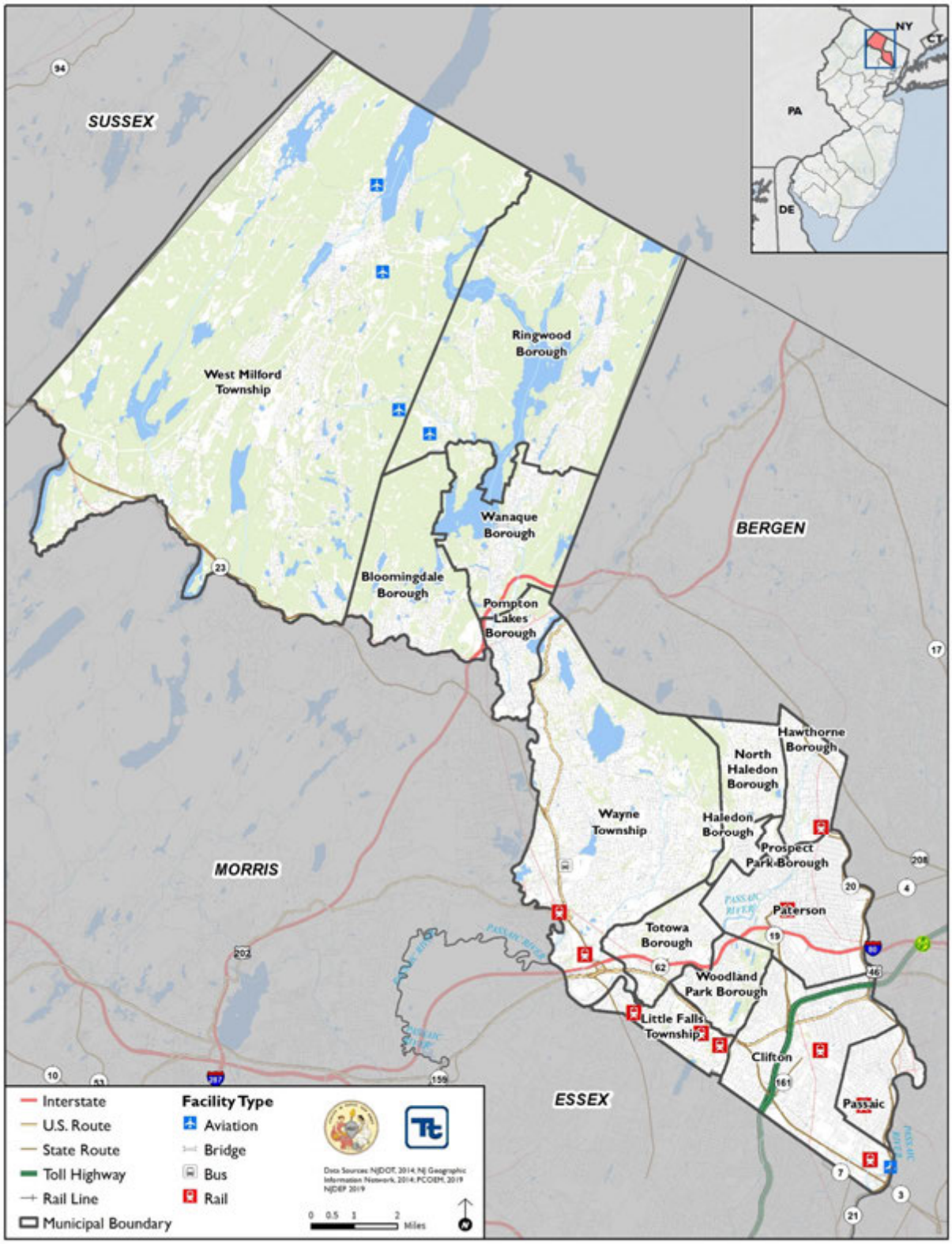
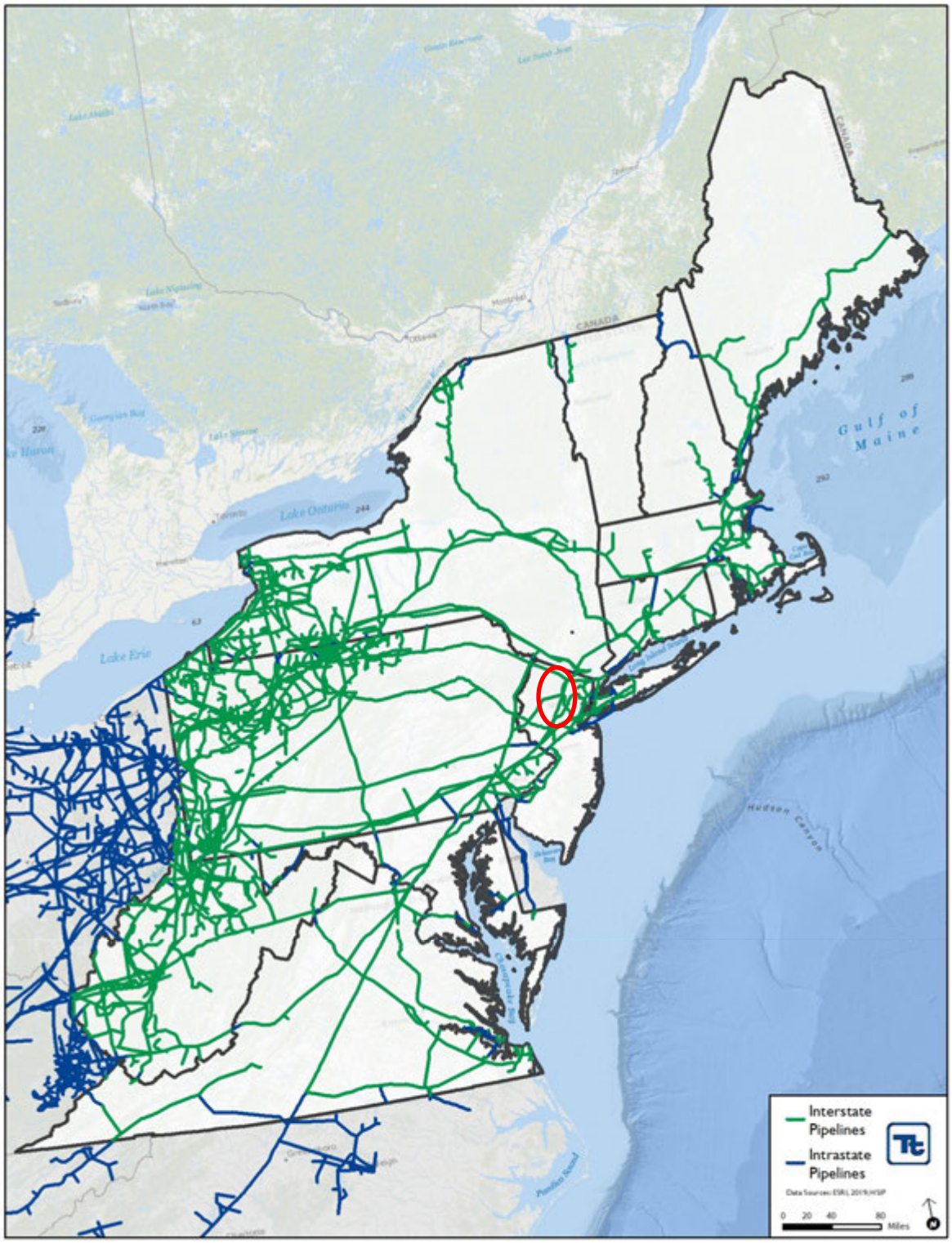


Figure 4.3.9-2. Interstate Natural Gas Pipelines in the Northeast



Source: NJDOT, n.d.
Note: The approximate location of Passaic County is indicated by the red circle.

Extent

The extent of a hazardous substance release will depend on whether it is from a fixed or mobile source, the size of impact, the toxicity and properties of the substance, duration of the release, and the environmental conditions (for example, wind and precipitation, terrain, etc.). The severity of a hazardous material release relates to its impact on human safety and welfare and on the threat to the environment. The types of threats to human safety and welfare include: poisoning of water or food sources and/or supply; presence of toxic fumes or explosive conditions; damage to personal property; need for the evacuation of people; and interference with public or commercial transportation. The threats to the environment include: injury or loss of animals or plants or habitats that are economic or ecological importance such as commercial, recreation or subsistence fisheries or livestock, seal haul outs, and marine bird rookeries; impact to recreational areas such as public beaches; and impact to ecological reserves, forests, and archaeological and cultural sites (Passaic County HMP 2010).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous substances can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

With a hazardous substance release, whether accidental or intentional, several potentially exacerbating or mitigating circumstances will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place measures protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alters dispersion of hazardous substances on-compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase the damage to the facility itself and to surrounding buildings

As discussed earlier, the severity of the incident is dependent not only on the circumstances described above, but also with the type of substance released and the distance and related response time for emergency response teams. The areas proximate to the releases are generally at greatest risk; however, depending on the agent, a release can travel great distances or remain present in the environment for a long period of time (i.e. centuries to millennia).

Previous Occurrences and Losses

Between 1954 and 2019, the State of New Jersey was not included in any FEMA declared disasters (DR) or emergencies (EM) related to hazardous substances incidents (FEMA 2020).

The U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) provides an incident report database for information on incidents throughout the U.S. According to this database, between 2013 and 2016, there have been 15 incidents in Passaic County (all highway) (NJOEM 2019). The U.S. EPA maintains records of the amount of chemicals released at facilities each year. Between 2014 and 2018, Passaic County had a total of 123,714.8 pounds of chemicals released on-site and a total of 155,659.22 pounds of chemicals released off-site (EPA 2020).

Probability of Future Occurrences

Predicting future hazardous substance incidents in Passaic County is difficult. They can occur at anytime and anywhere in the County. Incidents can be sudden without any warning or slowly develop. Small spills, both fixed site and in-transit, occur throughout the year and the probability for these events are high.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering and Planning Committees, the probability of occurrence for the release of hazardous substances in the County is considered 'frequent'. It is estimated that the County will continue to experience direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, water quality and supply concerns, and transportation delays, accidents and inconveniences.

Climate Change Impacts

Hazardous substance incidents are non-natural incidents; therefore, there are no implications for impacts from climate change. Secondary impacts, such as excessive heat on containers may occur, but also can occur during normal fluctuations in temperature.

4.3.9.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable to the identified hazard. The following section discusses Passaic County's vulnerability, in a qualitative nature, to hazardous substance events.

Impact on Life, Health and Safety

Depending on the type and quantity of chemicals released and the weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When hazardous substances are released in the air, water or on land they may contaminate the environment and pose greater danger to human health. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

Due to the varied location of different hazardous substances and wastes sites in Passaic County, the entire County is considered vulnerable to this hazard. Those particularly vulnerable include populations located along major transportation routes because of the quantities of chemicals transported on these major thoroughfares. Potential losses from hazardous substances incidences include human health and life and property resources. These types of incidents can lead to injury, illnesses, and/or death from both the involved persons and those living in the impacted areas.

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. The 2017 report lists 29 facilities in Passaic County, with a majority located in Clifton (EPA 2017).

Superfund is a program administered by the U.S. EPA to locate, investigate, and cleanup the worst hazardous waste sites throughout the U.S. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicated that Passaic County has 2 Superfund sites (NJOEM 2019). One of the sites is in the Borough of Ringwood and the other site is located in Wayne Township.

Impact on General Building Stock

Potential losses to the general building stock caused by a hazardous substance releases, whether in transit or at fixed sites, is difficult to quantify. The degree of damages depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. The closure of waterways, railroads, airports and highways as a result of a hazardous substance incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and level of service disruptions.

Impact on Critical Facilities

Potential losses to critical facilities caused by a hazardous substance incident is difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. Refer to Section 3 (County Profile) which summarizes the number and type of critical facilities in Passaic County.

Impact on Economy

If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Passaic County may be impacted as well. A significant incident in an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. The exact impact on the economy is difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substance incidents have the potential to lead to major transportation route closures in Passaic County. The closure of waterways, railroads, airports, and highways as a result of these incidents has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the level of services disruptions.

Impact on Environment

Hazardous wastes that are released into the environment can be harmful to species and their habitat (EPA 2020). Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the localized habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like the EPA to ensure that the environment and community is protected from these types of events.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development and Change in Population

Passaic County has been and is projected to continue to grow in population. In addition, as discussed in Sections 3 and 9, areas are targeted for future growth and development. As areas near major transportation routes continue to be developed, this may increase the population exposed to in-transit hazardous material releases.

Climate Change

As temperatures change, excessive heat on containers that contain hazardous materials may alter the material properties. In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the project changes in increased precipitation events; magnitude and frequency

Change of Vulnerability

Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to hazardous substance incidents.

4.3.10 Infestation and Invasive Species

The following section provides the hazard profile and vulnerability assessment for the infestation hazard in Passaic County.

2020 HMP Changes

- This is a new hazard of concern for Passaic County.

4.3.10.1 Profile

Hazard Description

An infestation is defined as a state of being invaded or overrun by parasites that attack plants, animals and humans. Insect, fungi and parasitic infestations can result in destruction of various natural habitats and cropland, impact human health, and cause disease and death among native plant, wildlife and livestock. An infestation is the presence of a large number of pest organisms in an area or field, on the surface of a host, or in soil. They result from when an area is inhabited or overrun by these pest organisms, in numbers or quantities large enough to be harmful, threatening or obnoxious to native plants, animals and humans. Pests are any organism (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that are a threat to other living species in its surrounding environment. Pests compete for natural resources or they can transmit diseases to humans, crops and livestock. Human populations are generally impacted by insect or animal infestations that can result in health impacts and can lead to potential epidemics or endemics.

For the purpose of this HMP Update, the infestation hazard profile will include the following: emerald ash borer, Japanese Maplewood, harmful algal bloom, and gypsy moth.

Gypsy Moth

Source: NJDA 2020

The gypsy moth is one of most devastating forest pests in the United States and the most destructive forest insect pest to infest New Jersey's forests. Gypsy moths have a large appetite and can cause defoliation of trees. The gypsy moth feeds on a variety of trees, which include oak, maple, birch, beech, willow, and hickory. The larger caterpillars have been known to feed on pine, spruce, hemlock, and many common ornamentals. The gypsy moth develops in four stages: egg, larvae (caterpillars), pupa (transformation stage), and adult (moth). Only the larval stages are destructive. It is not uncommon to observe large numbers of migrating caterpillars crossing roads and on the sides of dwellings and other stationary objects. Migrating caterpillars can stain paint on houses and if handled, their body hairs may irritate the skin of susceptible people. The entire State is now considered to be infested by the gypsy moth (NJDA 2019).

Mosquitoes

Mosquito infestations can result in the spread of disease such as West Nile Virus, Eastern Equine Encephalitis (EEE), and Zika virus through bites from infested mosquitoes. Mosquitos typically lay eggs in or near standing water. For more information on infectious disease spread by mosquitoes, refer to 4.3.2 (Disease Outbreak).

Emerald Ash Borer

Source: NJDA 2020

Emerald Ash Borer (EAB) was first discovered in Somerset County in 2014 and first detected in Passaic County in the Borough of Ringwood in 2019. This Asian beetle infests and kills North American ash tree species, including green, white, black and blue ash; making all native ash trees susceptible to this insect. The insect is typically present from late May through early September and is most common in June and July. Signs of infection include tree canopy dieback and yellowing and browning of leaves. Most trees die within two to four years of becoming infested (NJDA 2020).

Japanese Maplewood

There are several insect problems with Japanese maples. Most common pest is the Japanese beetles. These leaf feeders can destroy the tree in a matter of weeks. Other Japanese maple pests are scale, mealybug and mites. While these pests can attack a tree of any age, they're usually found in young trees. All of these pests present as tiny bumps or cottony-like dots on twigs and leaves. They produce a honeydew, which attracts sooty mold (GardeningKnowHow 2020).

Spotted Lanternfly

Source: NJAES 2020

The spotted lanternfly (*Lycorma deliculta*) is an Asian plant hopper. The adults are quite colorful with a black head, grayish black spotted forewings, and reddish black spotted hind wings. Adults are approximately 1" in length and a 1/2" in width and are present from mid-July through the fall. During this time, SLF adults are mating and laying eggs. Egg masses are laid on smooth surfaces and appear like a patch of mud.

In the USA, spotted lanternfly is an invasive species that could be very devastating to some New Jersey crops and hardwood trees. This insect was accidentally introduced into Pennsylvania and was confirmed in September 2014. In 2018, spotted lanternfly populations were found in New Jersey and a state quarantine encompassing Mercer, Hunterdon, and Warren counties has been established by the NJ Department of Agriculture (New Jersey Agricultural Experiment Station [NJAES] 2020).

The spotted lanternfly can feed on more than 70 plant species including cultivated grapes, fruit trees, and hardwood trees. One tree of particular importance is *Ailanthus altissima* or the Tree of Heaven which is abundant in New Jersey. Tree of Heaven typically grows in clumps in sunny areas along highways or disturbed habitats such as the edges of crop fields, open spaces, or parks. Other key tree hosts include black walnut; red maple; and agricultural crops such as grapes, hops, apples, and peaches.

As with all plant hoppers, the spotted lanternfly has sucking mouthparts that it inserts into plant tissues to remove the fluids it needs to survive. Adults and nymphs are phloem feeders that feed in large congregations on woody tissue. Although there are no numbers or estimates on the economic impact of the spotted lanternfly—because this insect feeds in large numbers it can quickly cause damage. Feeding occurs on the trunk and limbs of plants, not on the fruit or leaf tissues. During feeding, the insect excretes significant amounts of honey dew (or sugar water). Honey dew deposits provide a food source for a sooty mold fungus that can grow on plant surfaces and fruit leading to reduced photosynthesis and plant vigor, leading to additional plant damage (NJAES 2020).

Harmful Algal Bloom

A harmful algal bloom (HAB) is an algal bloom that can be dangerous to people, animals or the ecology. Some, but not all, HABs produce chemicals that can be toxic to humans and animals if ingested, inhaled, or if contacted by skin or mucous membranes. These toxins can also accumulate in fish and shellfish which can cause illness when either are consumed. HABs can occur in both the freshwater and marine water environments. There is no scientifically sound treatment to eliminate HABs from water bodies, so advanced and continuous monitoring is the key element in protecting health and assessing when the lake is safe for swimming and recreational activities (NJDEP 2019).

Location

Due to the diversity of landscape in Passaic County, the entire County has the potential to be impacted by each of the species identified above. Bodies of water, including Greenwood Lake in West Milford have the potential to be impacted by HABs.

Emerald Ash Borer

Three species of ash are native to Passaic County an all are susceptible to EAB: white ash *(F. Americana),* green ash *(T. pennsylvanica*), and black ash (*F. nigra*). EAB was first detected in New Jersey in May 2014 and detected in Passaic County (Borough of Ringwood) in 2019; refer to Figure 4.3.10-1.

Japanese Maplewood

Japanese Maples are most common in areas where human disturbance has occurred or where invasive plants have been unintentionally released, but can be found throughout Passaic County.

Spotted Lanternfly

According to NJDA, there is no spotted lanternfly infestation present in Passaic County as of March 2020; however, infestations and individual finds have been identified surrounding the County. Refer to Figure 4.3.10-2.

Harmful Algal Bloom

HABs have the potential to impact bodies throughout Passaic County and New Jersey.

Extent

The extent and location of infestations and invasive species depends on the preferred habitat of the species, as well as the species' ease of movement and establishment. However, each of these threats can impact many areas of Passaic County. The magnitude of infestations and invasive species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as periods of drought. The already weakened state of the ecosystem causes it to more easily be impacted to an infestation.

Gypsy Moth

In New Jersey, municipalities with heavy infestations of gypsy moths, as delineated by a summer aerial defoliation survey, are contacted in writing by the NJDA in early fall. The municipalities are asked, if they wish, to have a gypsy moth egg mass count. This is done to determine if the infestation will continue and what areas qualify for the spray program. If the area has an average of more than 500 egg masses per acre, and is at least

50 acres in size, it may qualify for participation in the cooperative gypsy moth suppression program. Municipal participation is voluntary (NJ DEP 2018).

In 2016, the NJDA's spray program included 20,355 acres in 27 municipalities and one county park system in Cape May, Salem, Hunterdon, Morris, Passaic, Sussex and Warren counties. In 2017, the NJDA's spray program included 4,500 acres in 11 municipalities in Cape May, Morris, Ocean, Passaic, Sussex and Warren counties to combat the tree-killing gypsy moth caterpillar. Both treatments and defoliation are down due to a combination of effective treatments in 2017 and sporadic *E. maimaiga* (gypsy moth fungus), reducing the populations especially in the northern counties of the state (NJ DEP 2018)

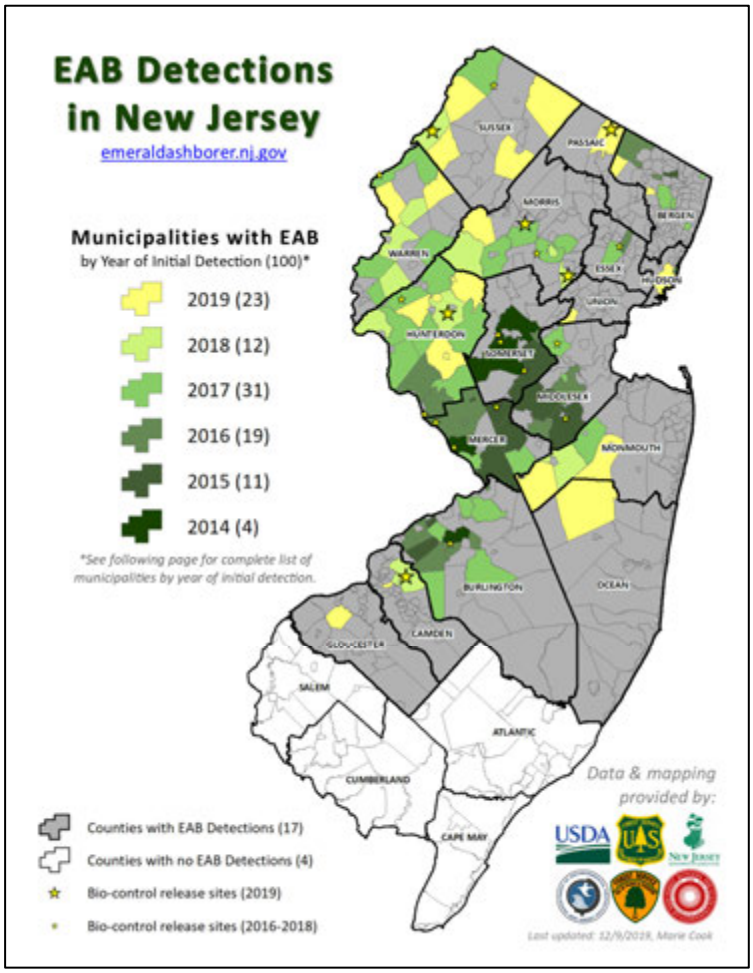
Mosquitoes

The extent of mosquito-borne viruses is described in Section 4.3.2 (Disease Outbreak). Disease impacts can result in flu-like symptoms, brain damage, or death.

Spotted Lanternfly

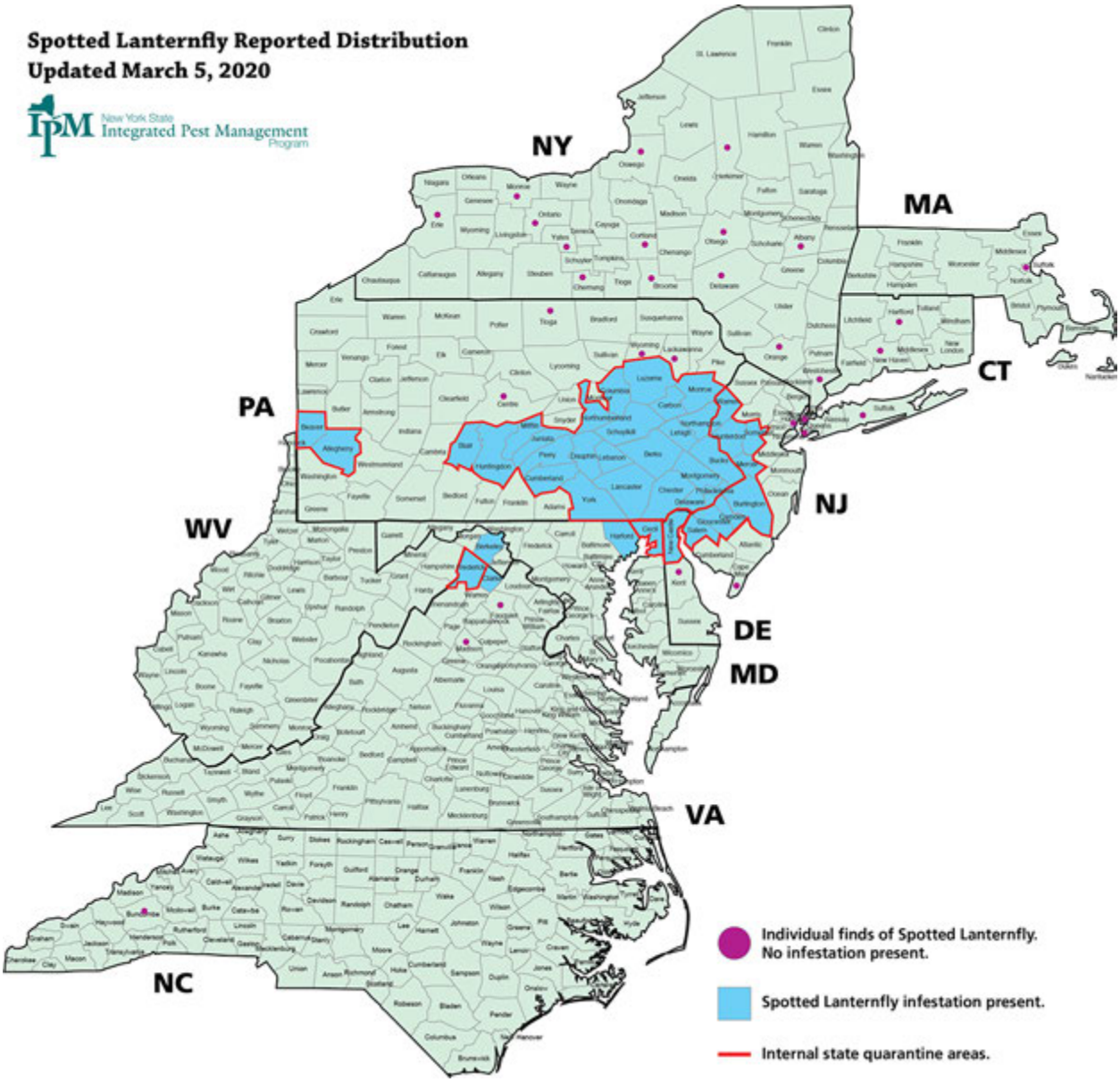
Spotted Lantern Fly damages plants through the extraction of plant sap. Infestations of Spotted Lanternfly can result in decimation of crops, forest habitat, and landscaping (NJDA 2019).

Figure 4.3.10-1. Emerald Ash Borer Detections in New Jersey



Source: State of New Jersey Department of Agriculture 2020

Figure 4.3.10-2. Spotted Lanternfly Reported Distribution as of March 2020



Source: NJDA 2020

Emerald Ash Borer

The NJ Emerald Ash Borer Task Force and other experts predict a 99% mortality rate for untreated ash trees. Peak die off of trees is likely to occur 9 to 10 years after the initial infestation. This suggests that Passaic County will be dealing with large volumes of tree deaths in the next 15 years. Management options for EAB include tree removal, treating with insecticides, and biological controls (the release of wasps which act as parasitoids for egg and larvae). The United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA, APHIS, PPQ), operates the biological control production facility in Michigan which was designed to produce EAB parasitoids for release. In order to be considered for inclusion in the parasitoid release program, release sites must meet a certain criteria to be eligible: the site must be forested at least 40 acres in size; the site must contain no less than 25% ash of varying age classes; ash trees must be

relatively healthy; and EAB must be detected proximate to the release site and be in low to moderate densities. The New Jersey Department of Agriculture (NJDA) is coordinating New Jersey's EAB biocontrol program.

Japanese Maplewood

Certain invasive plant species such as Giant Hogweed contain sap that can cause painful burns and permanent scarring (NYS DEC, Date Unknown). However, most negative impacts from invasive plants involve the destruction of natural habitat and potential damages to infrastructure due to root system impacts.

Harmful Algal Bloom

In 2019 the New Jersey side of Greenwood Lake in West Milford was closed due to harmful algal bloom infestation. DEP advised the public to avoid swimming or participating in water sports that may result in contact with the water. They also advised that fish caught in the New Jersey portion of the lake should not be eaten and advised the public to protect their pets from drinking its waters (NJDEP 2019).

Previous Occurrences and Losses

Many sources provided information regarding infestations in Passaic County; however, specific events and/or losses pertaining to the species discussed above were not identified. As described in earlier in this section, a HAB effected the New Jersey side of Greenwood Lake in West Milford, denying access to residents to use it for recreation or fishing.

Based on information stated earlier in this profile, Passaic County has been and will continue to be impacted by infestations and invasive species. Between 1954 and 2015, FEMA included the State of New Jersey in one infestation-related emergency (EM) classified as a virus threat (EM-3156 in November 2000). Passaic County was included in this declaration (FEMA 2020). For details regarding West Nile Virus in Passaic County, refer to Section 4.3.2 (Disease Outbreak).

Figure 4.3.10-1. Aerial Defoliation Survey from Gypsy Moth in Passaic County

Municipality	Moderate 25-50%	Heavy 51-75%	Severe 76-100%	Total
2015				
Bloomingdale Borough	0	4,193	191	4,384
Pompton Lakes Borough	0	530	0	530
Ringwood Borough	0	12,744	820	13,564
Wanaque Borough	0	2,203	0	2,203
Wayne Township	0	73	0	73
West Milford Borough	0	3,951	36,681	40,632
Total	**0**	**23,694**	**37,692**	**61,386**
2016				
Bloomingdale Borough	246	0	0	246
Wanaque Borough	53	0	0	53
West Milford Township	351	109	0	460
Total	**650**	**109**	**0**	**636**
2017				
Ringwood Borough	0	1,735	0	1,735
Wanaque Borough	28	0	0	28
West Milford Borough	40	758	224	1,022

Municipality	Moderate 25-50%	Heavy 51-75%	Severe 76-100%	Total
Total	**68**	**2,493**	**224**	**2,785**
		2018		
Bloomingdale Borough	0	262	0	262
Ringwood Borough	0	456	0	456
Wanaque Borough	0	1,628	0	1,628
West Milford Borough	20	127	0	147
Total	**20**	**2,473**	**0**	**2,493**
		2019		
Ringwood Borough	88	0	0	88
West Milford Township	76	0	0	76
Total	**164**	**0**	**0**	**164**

Source: NJDA 2019

Probability of Future Occurrences

Based on historical documentation, increased incidences of infestation throughout the State of New Jersey and the overall impact of changing climate trends, it is estimated that Passaic County and all its jurisdictions will continue to experience infestation events that may induce secondary hazards and health threats to the County population if infestations are not prevented, controlled or eradicated effectively. Based on these historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for infestation and invasive species in Passaic County is considered "frequent". Refer to Section 4.4. (Hazard Ranking) for more information.

Climate Change Impacts

Providing projections of future climate change for a specific region is challenging. Shorter term projections are more closely tied to existing trends making longer term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes.

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2017). Most of this warming has occurred since 1970. The State of New Jersey has observed an increase in average annual temperatures of 1.2°F between the period of 1971-2000 and the most recent decade of 2001-2010. Winter temperatures across the Northeast have seen an increase in average temperature of 4°F since 1970 (Northeast Climate Impacts Assessment [NECIA] 2007). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2013).

Northern New Jersey's 1971-2000 precipitation average was over five inches (12-percent) greater than the average from 1895-1970 (Sustainable Jersey Climate Change Adaptation Task Force [CATF] 2011). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Increased rainfall and heavy rainfalls increase the risk of flooding events.

Annual precipitation for New Jersey has been about 8 percent above average over the last 10 years. The number of extreme precipitation events has also been above average over the last 10 years. During 2010–2014, the state experienced the largest number of extreme precipitation events (days with more than 2 inches) compared to any other 5-year period, about 50 percent above the long-term average. Winter and spring precipitation are projected to increase for the 21st century; extreme precipitation is also projected to increase. The projections of increasing precipitation are characteristic of a large area of the Northern Hemisphere in the northern middle latitudes, as

well as increases in heavy precipitation events. This may result in increased flooding risks throughout the state (NCEI 2019).

The following provides information on the different infestations impacted Passaic County and how they may be affected by climate change.

Gypsy Moth

Gypsy moths are cold-blooded insects and are particularly sensitive to climate changes. Gypsy moths require a climate warm enough for the adults to emerge, have time to mate, and lay eggs and have the eggs develop. The winter temperatures are also important for egg development. A changing climate has the potential to impact the population of gypsy moths, either be increase their population or decreasing (Center for Coastal Resources Management 2015).

Emerald Ash Borer

A warmer climate would extend the active insect season and allow for species that are not as cold tolerant to move north and expand their range. This increases the impact of the emerald ash borer and their related impacts.

Japanese Maplewood

As the climate changes, ecosystems can become stressed which can allow for invasive plant species to take hold and become more problematic. A changing climate can result in new species entering regions where they previously could not survive. It can also result in species hierarchies in ecosystems changing, leading to new dominant species that may have more invasive tendencies (Masters & Norgrove 2010).

Harmful Algal Bloom

The projected increase in precipitation is expected to occur via heavy downpours and less in the form of light rains. Rising air temperatures intensify the water cycle by increasing evaporation and precipitation, which can cause an increase in rain totals during storm events, with longer dry periods between those events. Alternating periods of drought and heavy rainfall increase the likelihood of nutrient runoff into waterways, which can fuel algal blooms (EPA 2017a).

Warmer temperatures could lead to an increase of the length of the algal growing season and increase the likelihood of algal blooms. In addition to warmer temperatures and heavy precipitation events, carbon dioxide levels are forecast to continue to increase. Higher levels of carbon dioxide in the atmosphere and water can lead to increased algal growth, particularly for cyanobacteria that float at the surface (EPA 2017a).

4.3.10.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable. For the infestation and invasive species hazard, the entire County is exposed. The following discusses Passaic County's vulnerability, in a qualitative nature, to the infestation and invasive species hazard.

Impact on Life, Health and Safety

The entire population of Passaic County is vulnerable. According to the 2017 American Community Survey (ACS) 5-year Estimate, Passaic County had a population of 510,562. Of that total population, the elderly population and people with suppressed immune systems are most susceptible to the effects of infestations such as West Nile Virus. The ACS has identified that there are 69,429 persons over the age of 65 in Passaic County.

As discussed earlier, infestations can have an impact on agricultural commodities. The NJDA has indicated that New Jersey farmers lose $290 million annually in direct crop loss or damage caused by agricultural pests (New Jersey Department of Agriculture n.d.). This destruction of crop may include consumable resources that are sold to persons in the County. Section 4.3.4 (Drought) discusses the number of farms that are operating in the County (i.e., 89 farms). Based on the Department of Agriculture's study, it is reasonable to assume that the farms in Passaic County also experience losses in crops. This not only impacts the livelihood of the farmers; it also affects the community that relies on these crops for food or other commodities.

Impacts of HABs on life, health, and safety depend on several factors, including the severity of the event and whether citizens and tourists have become exposed to waters suspected of containing a HAB. Routes of exposure include consumption, inhalation, and dermal exposure. The population living near waterbodies is at risk for exposure to HABs as well as those that use those waterbodies for recreation, fishing, and water supply. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but visitors to Passaic County lakes as well. Contact with water containing HABs can cause various health effects including diarrhea, nausea or vomiting; skin, eye, or throat irritation; and allergic reactions or breathing difficulties (NYSDOH 2018).

Cyanobacteria blooms are one of the most common freshwater HABs and have been identified by NJ DEP as being present in Passaic County blooms. Cyanobacteria are known to produce toxins from the following classes:

Endotoxins: Endotoxins associated with cyanobacteria have been tied to fever and inflammation in humans that have come in contact with water that contains cyanobacterial blooms.

Hepatotoxins: Hepatotoxins are commonly tied to animal poisonings that are associated with cyanobacterial blooms. Animals may exhibit weakness, heavy breathing, paleness, cold extremities, vomiting, diarrhea, and bleeding in the liver. In humans, hepatotoxins have been indicated to promote tumors and may lead to increases in liver cancer. Some types of hepatotoxins, such as microcystin, can persist in fresh water for up to 2 weeks before being naturally broken down (algae).

Neurotoxins: Neurotoxins act to block transfers between neurons. Extreme cases can result in paralysis.

The typical impact of HABs on critical facilities is due to shut down of water intakes from surface waters that are impacted by blooms and their toxins. Water treatment plants remove variable amounts of microcystin from drinking water, but as much as 20 percent of these toxins may escape the treatment process (Carmichael 1997), sometimes leading to plant closures.

The EPA has established an incident checklist for HAB incidents impacting water utilities (EPA 2017). This tool is available to help utilities detect, identify, and monitor a bloom. Locations in Passaic County that rely on surface water intake for drinking water are most exposed to the impacts of HABs. Purchasing water may make some users more vulnerable if the utility has less control over the quality of the source. Coordinating with the supplier to ensure that the water is clear of harmful algae, thus maintaining the safety of users of the purchased water, is recommended.

Impact on General Building Stock

Structures are not anticipated to be directly affected by infestation or invasive species; however, the Emerald Ash Borer may cause a catastrophic loss of ash trees throughout the County, which could result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly cause foundation issues for nearby structures. Additionally, with an increased number of dead trees, there is an increased risk of trees falling on roadways, power lines, and buildings.

Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other invasive plant species have been known to clog culverts and streams, increasing flooding risk.

Impact on Critical Facilities

Water treatment plants could be impacted by infestation and invasive species because of similar issues that the general building stock may experience. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

Impact on Economy

Impacts of infestation and invasive species and infestations on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with activities and programs implemented to conduct surveillance and address invasive species and infestations have not been quantified in available documentation. However, as indicated by the NJDA, farmers across the State may collectively revenue because of crop losses from invasive species and infestations (New Jersey Department of Agriculture n.d.). In 2017, there were 308 acres of cropland in Passaic County, and 270 acres that was harvested (USDA 2017). Therefore, it is reasonable to believe that Passaic County farmers have experienced monetary losses from infestations.

The New Jersey Forest Service has indicated that 9-percent of New Jersey forests are susceptible to emerald ash borer attacks (NJDEP 2016). The emerald ash borer can infect nursery stock and mature trees, which could reduce the timber value of hardwood exports (CFIA 2014). In 2010, the USDA Northern Research Station conducted computer simulations of EAB spread to estimate the cost of ash tree treatment, removal, and replacement (re-planting of new trees) between 2009 and 2019. The simulations predicted an EAB infestation covering 25 states, and assumed treatment, removal, and replacement of more than 17 million ash trees on developed land within established communities. The total costs were estimated at $10.7 billion. This figure doubled when the model was reset to include developed land outside, as well as inside, human communities (USDA 2013).

HAB-related economic impacts on Passaic County would largely focus on the recreation sector. News of a closure of a body of water or beach can result in visitors avoiding the area. Even after closures are lifted, negative public reaction can persist and continue to impact local revenue and property values. As mentioned, there is a price tied to programs that protect water bodies from harmful algal blooms. The cost to operate and monitor these programs will vary depending on the extent of the blooms. Additional costs may include money spent on purchasing backup water sources and costs to implement advanced drinking water treatment.

Impact on the Environment

As previously discussed, Passaic County's parks, forests and neighborhood trees are vulnerable to gypsy moth, spotted lanternfly and EAB. Species that cause eventual destabilization of soil, such as invasive insects that destroy plants or invasive plants that outcompete native vegetation but have less effective root systems, can increase runoff into waterbodies. This can lead to increased harmful algal blooms and negative impact on drinking water supplies. Soil destabilization can also increase the likelihood of mudslides in areas with a steep slope.

The New Jersey Forest Service has indicated that the emerald ash borer will first infest the top of the tree's crown. This leads to the crown dying, bark splitting, and exit holes are created on lower parts of the tree. Trees that are infested only live on average of 3 to 4 years (NJDEP 2016).

Harmful algal blooms can release toxins that can kill fish and invertebrate. Animals that prey on fish and invertebrates in surface waters, such as birds and mammals, may be affected if they ingest impacted prey. Both harmful and non-harmful algal blooms can have drastic impacts on oxygen levels in surface waters. When algae begin to die off following a bloom, bacteria begin to decompose the organic material. This decomposition consumes dissolved oxygen and releases carbon dioxide. If the bloom and die off is large enough, dissolved oxygen levels in aquatic systems can rapidly crash. Anoxic conditions connected to algal blooms have resulted in large fish and invertebrate kills.

Future Changes that May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development and Change in Population

As discussed in Sections 3 (County Profile) and 9 (Jurisdictional Annexes), areas targeted for future growth and development have been identified across Passaic County. Changes in land use have the potential to render some habitats more susceptible to invasive species, such as clearing the land and providing opportunities for invasive species to inhabit the area. Clearing the land may also reduce the habitat for predator species that could manage the spread of invasive species naturally. The specific areas of development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Infestation to cropland and nurseries can have a wider impact on persons outside of Passaic County if the farmers within the County supply resources to neighboring communities. Being aware of trends occurring around the County may reveal that infestations within agricultural commodities provided by the County impacts a greater number of persons.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency, and intensity of weather events. Changing weather patterns could create a change in the migration patterns for when these species move into and out of Passaic County. If the species have a more prolonged existence in the County, there may also be a greater number of infestation events or a higher value of loss tied to infestation. Warmer temperatures could lead to an increase of the length of the algal growing season and increase the likelihood of algal blooms. Increased alternation of drought and heavy precipitation could result in additional nutrient runoff into local waterbodies, providing more fuel for algal blooms. Higher carbon dioxide levels in the atmosphere and surface waters could create a more favorable growing environment for HABs (EPA 2017a).

Vulnerability Change Since the 2015 HMP

Infestations and invasive species is a new hazard section added to the County's HMP. More frequent events of infestations and blooms have made this hazard an area of interest that will be monitored more frequently in municipalities throughout the County, particularly those that contain major bodies of water that are used for drinking water, recreation, and economic purposes.

4.3.11 Severe Weather

The following section provides the hazard profile and vulnerability assessment for the severe weather hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2014 and 2019.

4.3.11.1 Profile

Hazard Description

The severe weather hazard includes high winds, tornado, thunderstorms and hailstorms which are defined below. Nor'easters, hurricanes and tropical storms are discussed in Section 4.3.1 Coastal Storm.

High Winds

Wind begins with differences in air pressures and occurs through rough horizontal movement of air caused by uneven heating of the earth's surface. Wind occurs at all scales, from local breezes lasting a few minutes to global winds resulting from solar heating of the earth. High winds are often associated with other severe weather events such as thunderstorms, tornadoes, nor'easters, hurricanes, and tropical storms (discussed further in this section or in Section 4.3.1 Coastal Storms).

Tornadoes

A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 250 miles per hour (mph). Damage paths can be greater than 1 mile wide and 50 miles long. Tornadoes typically develop from either a severe thunderstorm or hurricane as cool air rapidly overrides a layer of warm air. Tornadoes typically move at speeds between 30 and 125 mph and can generate combined wind speeds (forward motion and speed of the whirling winds) exceeding 300 mph. The lifespan of a tornado rarely is longer than 30 minutes (FEMA 1997). Tornadoes can occur at any time of the year, with peak seasons at different times for different states (National Severe Storms Laboratory [NSSL] 2013).

Thunderstorms

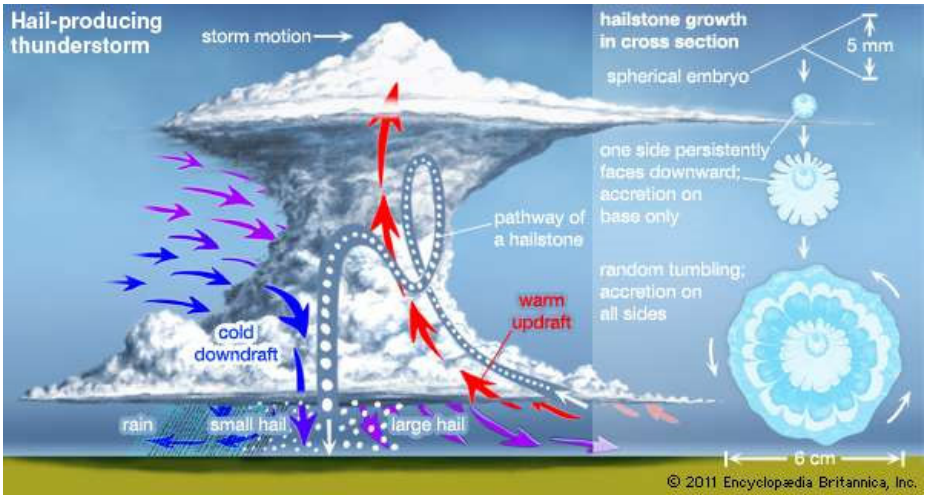
A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder (National Weather Service [NWS] 2009). A thunderstorm forms from a combination of moisture; rapidly rising warm air; and a force capable of lifting air, such as a warm front, cold front, a sea breeze, or a mountain. Thunderstorms form from the equator to as far north as Alaska. Although thunderstorms generally affect a small area when they occur, they have the potential to become dangerous due to their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and lightning.

Thunderstorms can lead to heavy rain induced flooding, landslides, strong winds, and lightning. Roads may become impassable from flooding, downed trees or power lines, or a landslide. Downed power lines can lead to loss of utility services, such as water, phone, and electricity. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes. During the summer, thunderstorms are responsible for most of the rainfall.

Hailstorms

Hail forms inside a thunderstorm or other storms with strong updrafts of warm air and downdrafts of cold water. If a water droplet is picked up by the updrafts, it can be carried well above the freezing level. Water droplets freeze when temperatures reach 32 degrees Fahrenheit (°F) or colder. As the frozen droplet begins to fall, it may thaw as it moves into warmer air toward the bottom of the thunderstorm. However, the droplet may be picked up again by another updraft and carried back into the cold air and re-freeze. With each trip above and below the freezing level, the frozen droplet adds another layer of ice. The frozen droplet, with many layers of ice, falls to the ground as hail. Most hail is small and typically less than (2 inches in diameter (NWS 2010). Figure 4.3.11-1 shows how hail is formed within thunderstorms.

Figure 4.3.11-1. Hail Formation in Thunderstorms

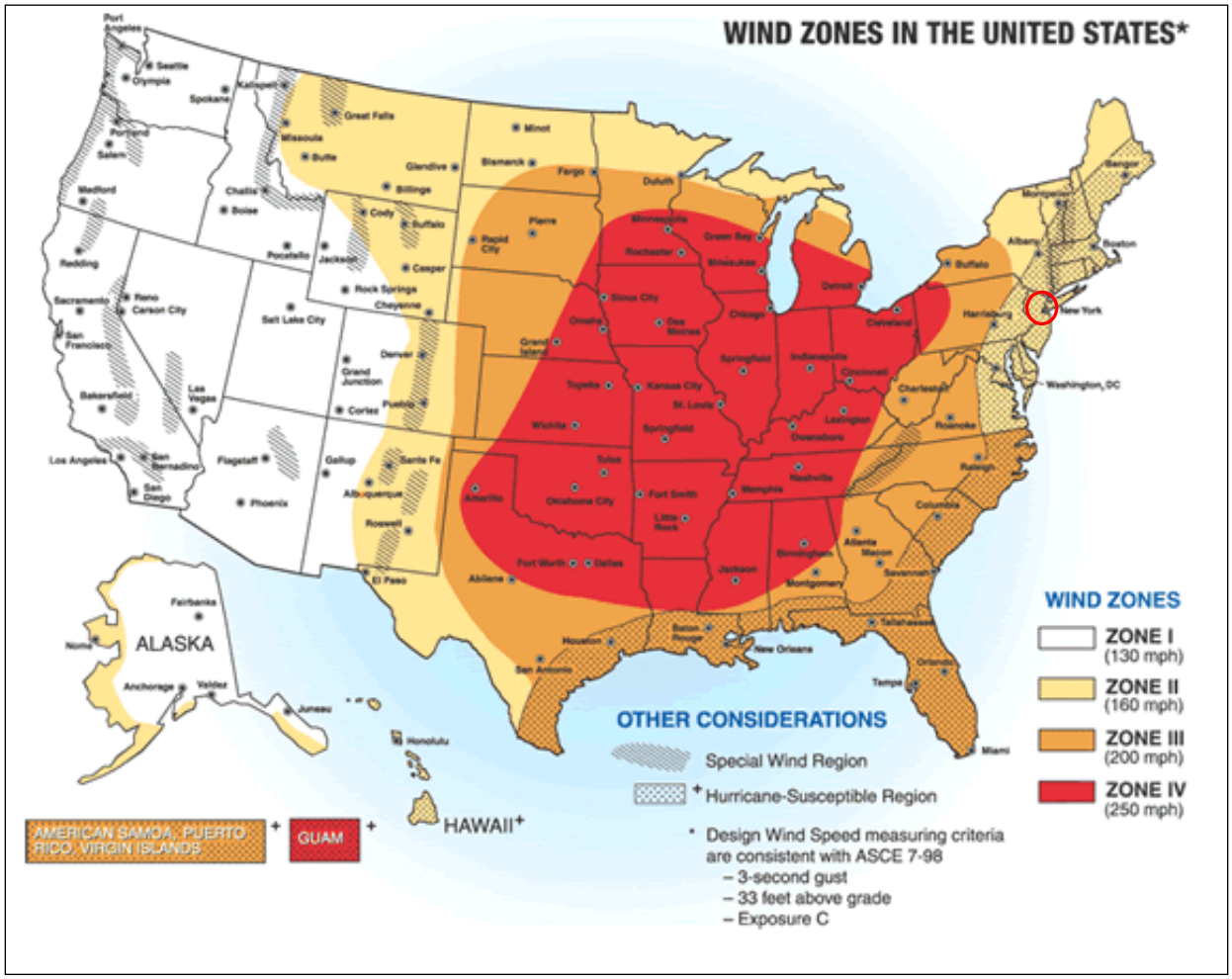


Source: Encyclopedia Britannica 2011

Location

All of Passaic County is exposed to sever weather. According to the FEMA Winds Zones of the United States map, Passaic County is located in Wind Zone II, where wind speeds can reach up to 160 mph and is part of the hurricane-susceptible region. Figure 4.3.11-2 illustrates wind zones across the United States, which indicate the impacts of the strength and frequency of wind activity per region. This is based on 40 years of tornado data and 100 years of hurricane data, collected by FEMA.

Figure 4.3.11-2. Wind Zones in the United States



Source: *FEMA 2012*
Note: *The red circle indicates the approximate location of Passaic County.*

Extent

The extent (severity or magnitude) of a severe weather event is largely dependent upon the most damaging aspects of each type of severe weather.

High Winds

The following tables provide the severe weather descriptions in Passaic by the NWS.

Table 4.3.11-1. Severe Storm Extent in Passaic County (1950-2019)

Extent of Severe Storms in Passaic County	
Largest Hailstone on Record	1.5 inches
Strongest Tornado on Record	F-1
Highest Wind Speed on Record	70 knots

Source: SPC- NOAA 2018

Table 4.3.11-2 provides the NWS descriptions of winds during wind-producing events.

Table 4.3.11-2. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2010

The NWS issues advisories and warnings for winds. Issuance is normally site-specific. High wind advisories, watches and warnings are products issued by the NWS when wind speeds may pose a hazard or is life threatening. The criterion for each of these varies from state to state. Wind warnings and advisories for New Jersey are as follows:

- High Wind Warnings are issued when sustained winds of 40 mph or greater are forecast for one hour or longer, or wind gusts of 58 mph or greater for any duration
- Wind Advisories are issues when sustained winds of 30 to 39 mph are forecast for one hour or longer, or wind gusts of 46 to 57 mph for any duration (NWS, 2010).

Tornadoes

The magnitude or severity of a tornado is categorized using the Enhanced Fujita Tornado Intensity Scale (EF Scale). Figure 4.3.11-3 illustrates the relationship between EF ratings, wind speed, and expected tornado damage.

Figure 4.3.11-3. Enhanced Fujita Tornado Intensity Scale Ratings, Wind Speeds, and Expected Damage

EF Rating	Wind Speeds	Expected Damage	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.	 
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	 
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.	 
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	 
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.	 
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.	 

Source: NWS 2018

Tornado watches and warning are issued by the local NWS office. A tornado watch is released when tornadoes are possible in an area. A tornado warning means a tornado has been sighted or indicated by weather radar. The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly, that little, if any, advance warning is possible (NOAA 2011).

Thunderstorms

NWS considers a thunderstorm severe if it produces damaging wind gusts of 58 mph or higher, hail 1 inch (quarter size) in diameter or larger, or tornadoes (NWS 2010). Severe thunderstorm watches and warnings are issued by the local NWS office and NOAA's Storm Prediction Center (SPC). NWS and SPC will update the watches and warnings and will notify the public when they are no longer in effect. Watches and warnings for thunderstorms in New Jersey are defined as follows:

- *Severe Thunderstorm Warnings* are issued when there is evidence based on radar or a reliable spotter report that a thunderstorm is producing (or is forecast to produce) wind gusts of 58 mph or greater, structural wind damage, and hail 1 inch in diameter or greater. A warning will include the location of the storm, the municipalities that are expected to be impacted, and the primary threat associated with the severe thunderstorm warning. After it has been issued, the NWS office will follow up periodically with Severe

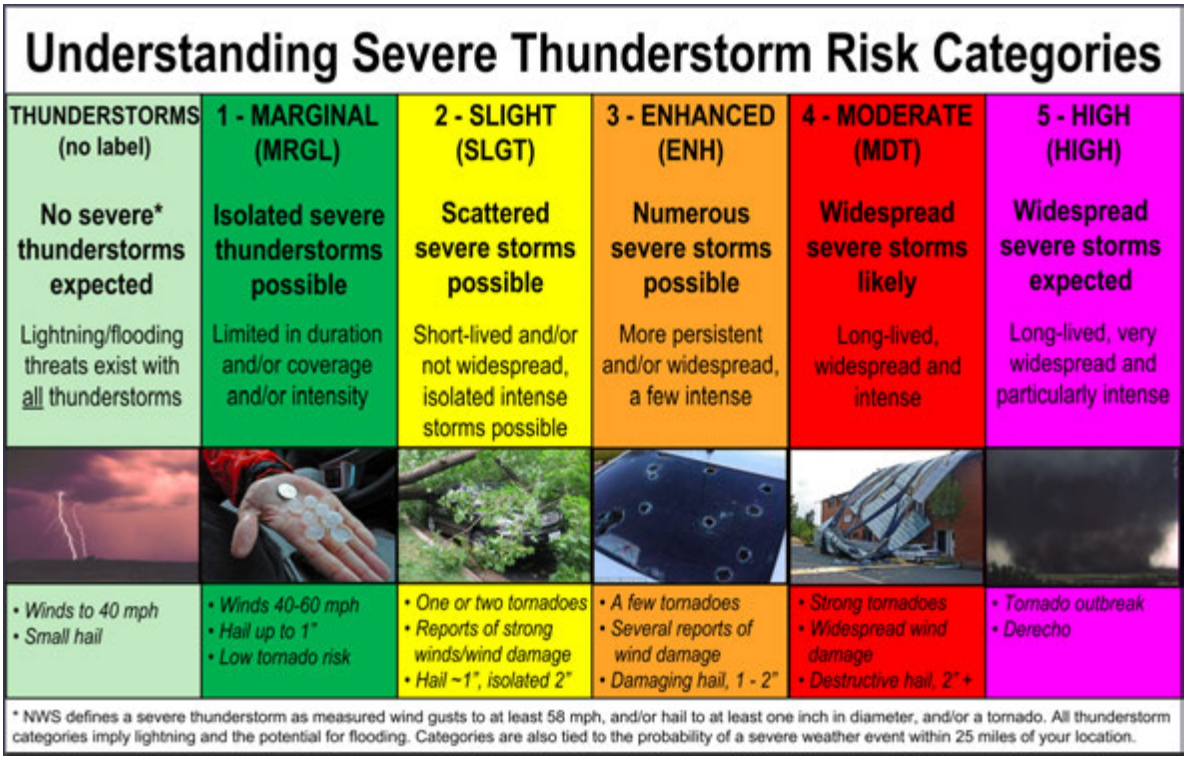
Weather Statements, which contain updated information on the severe thunderstorm and will let the public know when the warning is no longer in effect (NWS 2010).

- *Severe Thunderstorm Watches* are issued by the SPC when conditions are favorable for the development of severe thunderstorms over a larger-scale region for a duration of at least 3 hours. Tornadoes are not expected in such situations, but isolated tornado development may also occur. Watches are normally issued well in advance of the actual occurrence of severe weather. During the watch, NWS will keep the public informed on developments happening in the watch area and will also notify the public when the watch has expired or been cancelled (NWS 2010).

- *Special Weather State for Near Severe Thunderstorms* bulletins are issued for strong thunderstorms that are below severe levels, but still may have some adverse impacts. Usually, they are issued for the threat of wind gusts of 40 to 58 mph or small hail less than one (1) inch in diameter (NWS 2010).

In addition, the SPC issues severe thunderstorm risk maps based on the likelihood of different severities of thunderstorms. Figure 4.3.11-4 shows the SPC's severe thunderstorm risk categories.

Figure 4.3.11-4. Severe Thunderstorm Risk Categories



Source: NOAA SPC 2017

Hailstorms

The severity of a hail storm is measured by duration, hail size, and geographic extent. Most hail stones from hail storms are made up of variety of sizes. The size of hail is estimated by comparing it to a known object. Table 4.3.11-3 describes the different sizes of hail as compared to real-world objects and lists approximate measurements.

Table 4.3.11-3. Hail Size

Size	Inches in Diameter
Pea	0.25 inch
Marble/mothball	0.50 inch
Dime/Penny	0.75 inch
Nickel	0.875 inch
Quarter	1.0 inch
Ping-Pong Ball	1.5 inches
Golf Ball	1.75 inches
Tennis Ball	2.5 inches
Baseball	2.75 inches
Tea Cup	3.0 inches
Grapefruit	4.0 inches
Softball	4.5 inches

Source: NOAA 2012

Previous Occurrences and Losses

Table 4.3.11-4 summarizes historical severe weather events from 1950 to December 2019 in Passaic County based on data collected from the NOAA NCEI and FEMA disaster declaration databases.

Table 4.3.11-4. Severe Weather Events 1950-2018

Hazard Type	Number of Occurrences Between 1950 and 2019	Total Fatalities	Total Injuries	Total Property Damage ($)	Total Crop Damage ($)
High Winds	18	4	0	$1.050 M	$0
Tornado	3	0	0	$2.553 M	$0
Thunderstorm Wind	92	1	12	$221.75 K	$0
Hail	27	0	0	$0	$0
Heavy Rain	34	1	2	$0	$0
Lightning	13	1	4	$8.123 M	$0
Total	**187**	**7**	**18**	**$11,726,000**	**$0**

Source: NOAA-NCEI 2020; FEMA 2020

Notes: M Million; K Thousand

Between 1954 and 2019, FEMA included New Jersey in 115 severe storm-related major disaster (DR) or emergency (EM) declarations classified as one or a combination of the following disaster types: severe storms, flooding, and hurricane. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Passaic County has been included in five declarations for severe storm-related events classified as one or a combination of the following disaster types: severe storm, straight-line winds or tornado (FEMA 2019). Table 4.3.11-5 lists these events.

Table 4.3.11-5. Severe Storm-related FEMA Disaster Declarations for Passaic County

Declaration	Event Date	Declaration Date	Event Description
DR 1588	April 1-3, 2005	April 19, 2005	Severe Storm(s): Severe Storms and Flooding

Declaration	Event Date	Declaration Date	Event Description
DR-1694	April 14-20, 2007	April 26, 2007	Severe Storm(s): Severe Storms and Inland and Coastal Flooding
DR-1897	March 12-April 15, 2010	April 2, 2010	Severe Storm(s): Severe Storms and Flooding
DR-4039	September 28, 2011-October 6, 2011	October 14, 2011	Remnants of Tropical Storm Lee
DR-4048	October 29, 2011	November 30, 2011	Severe Storm(s): Severe Storm

Source: FEMA 2020

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2012 and 2019, Passaic County has been included in the following three USDA disaster declarations in relation to severe storms as indicated in Table 4.3.11-6.

Table 4.3.11-6. Severe Storm-related USDA Disaster Declarations 2012-2019 for Passaic County

Declaration	Event Date	Declaration Date	Event Description
S3593	May 1, 2013 – continuing	October 1, 2013	Excessive rain and related flooding, high winds, and hail
S4479	July 23, 2018 – continuing	April 10, 2019	Excessive Precipitation
S4455	July 20, 2018 – September 27, 2018	February 4, 2019	The combined effects of excessive rainfall, moisture, and storm-force winds from Hurricane Florence

Source: USDA 2020

Severe weather events that have impacted Passaic County between 2014 and 2019 are identified in Table 4.3.11-7. With severe weather documentation for New Jersey and Passaic County being so extensive, not all sources have been identified or researched. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality, when available.

Table 4.3.11-7. Severe Weather Events in Passaic County, 2014 to 2019

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Location	Description
July 22, 2019	Hail	N/A	N/A	Pompton Junction, Packanack Lake	A cold front stalled as a stationary boundary triggering severe thunderstorms that impacted Northeastern New Jersey.
May 26, 2019	Thunderstorm Wind	N/A	N/A	Prospect Park	A cold front triggered severe thunderstorms across Northeast New Jersey.
March 15, 2019	Hail, Thunderstorm Wind	N/A	N/A	Prospect Park, Passaic Park	A cold front moved through the region triggering strong to severe thunderstorms across Northeast New Jersey.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Location	Description
February 25, 2019	High Wind	N/A	N/A	Western Passaic	High winds occurred behind a strong cold front and deepening low pressure.
August 17, 2018	Thunderstorm Wind	N/A	N/A	Great Notch	A pre-frontal trough and mid-level disturbance triggered severe thunderstorms across the region.
August 7, 2018	Thunderstorm Wind	N/A	N/A	South Paterson	A hot and humid airmass with a weak surface trough, in association with an upper level trough triggered thunderstorms across the region.
May 15, 2018	Thunderstorm Wind	N/A	N/A	Pinecrest Lake, Little Falls, Prospect Park, Clifton	An approaching cold front triggered numerous severe thunderstorms over northeastern New Jersey.
March 2, 2018	High Wind	N/A	N/A	Eastern Passaic	A deep area of low pressure passed off the coast.
May 14, 2017	Thunderstorm Wind	N/A	N/A	West Milford ARPT, Clifton, Passaic	An upper level low triggered strong thunderstorms over Northeast New Jersey.
July 1, 2016	Thunderstorm Wind	N/A	N/A	North Hawthorne	A passing cold front triggered a few severe thunderstorms over northeast New Jersey.
June 5, 2016	Thunderstorm Wind	N/A	N/A	Packanack Lake	A passing cold front triggered a line of severe thunderstorms over Bergen and Passaic Counties.
June 21, 2015	Thunderstorm Wind	N/A	N/A	Prospect Park	A passing cold front triggered an isolated severe thunderstorm over eastern Passaic County.
July 8, 2014	Thunderstorm Wind	N/A	N/A	Haledon	A line of strong with embedded severe thunderstorms formed along a slow-moving cold front as it progressed through the Northeast.
July 3, 2014	Thunderstorm Wind	N/A	N/A	Prospect Park, Skyline Lake	As a cold front slowly moved across the area, moisture from Tropical Cyclone Arthur passing to the south and east converged along the boundary resulting in severe thunderstorms, heavy rain and flash flooding in portions of Northeast New Jersey.
July 3, 2014	Hail	N/A	N/A	Oak Ridge	As a cold front slowly moved across the area, moisture from Tropical Cyclone Arthur passing to the south and east converged along the boundary resulting in severe thunderstorms, heavy rain and flash flooding in portions of Northeast New Jersey.
June 13, 2014	Thunderstorm Wind	N/A	N/A	Pompton Lakes	An approaching cold front triggered a line of severe thunderstorms that produced heavy rain and resulted in flash flooding in portions of Northeast New Jersey.

Source: FEMA 2019; NCDC 2019; NWS 2019; SPC 2019; NJ HMP 2012; USGS 2011; NHC 2019; NOAA 2019
DR Disaster Declaration (FEMA) FEMA Federal Emergency Management Agency
Mph miles per hour N/A Not Applicable

Probability of Future Occurrences

Passaic County is expected to continue experiencing direct and indirect impacts of severe weather annually. These storms may induce secondary hazards such as flooding and utility failure. In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for severe storms in the County is considered 'frequent'.

The table below shows these statistics, as well as the annual average number of events and the percent chance of these individual flood hazards occurring in Passaic County in future years based on the historic record (NOAA NCEI 2020).

Table 4.3.11-7. Probability of Future Occurrence of Flooding Events

Hazard Type	Number of Occurrences Between 1950 and 2018	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent (%) chance of occurrence in any given year
High Winds	18	0.26	3.9	0.26	25.7
Tornado	3	0.04	23.3	0.04	4.3
Thunderstorm Wind	92	1.33	0.8	1.31	100
Hail	27	0.39	2.6	0.39	38.6
Heavy Rain	34	0.49	2.1	0.49	48.6
Lightning	13	0.19	5.4	0.19	18.6
Total	**187**	**2.71**	**0.37**	**2.67**	**100**

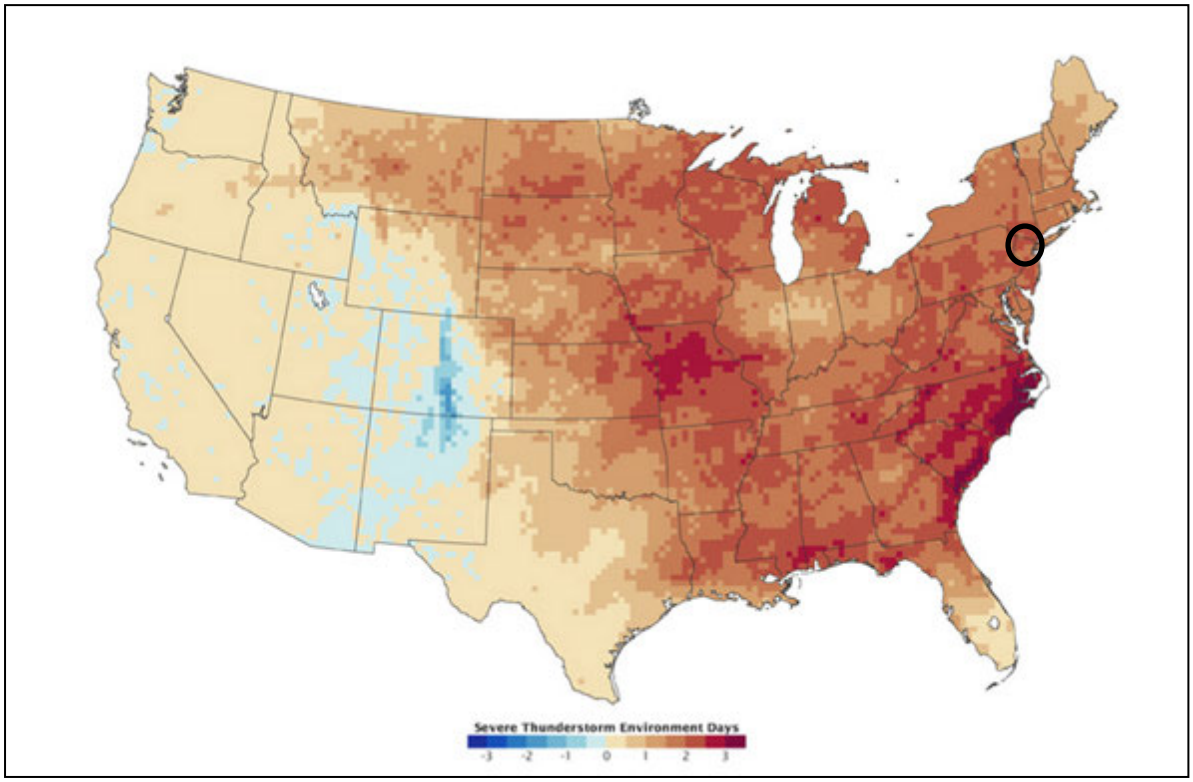
Source: NOAA-NCDC 2020
Note: Probability was calculated using the available data provided in the NOAA-NCEI storm events database. Due to limitations in data, not all severe weather events occurring between 1950 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is under-estimated. A 100 percent chance of occurring means that at least one severe weather event, regardless of type, is likely to occur annually.

Climate Change Impacts

New Jersey have become wetter over the past century. Northern New Jersey's 1971-2000 precipitation average was over five inches (12-percent) greater than the average from 1895-1970 (Sustainable Jersey Climate Change Adaptation Task Force [CATF] 2011). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Average annual precipitation is projected to increase in the region by four to 11-percent by the 2050s and five to 13-percent by the 2080s (New York City Panel on Climate Change [NPCC] 2015).

As the climate changes, temperatures and the amount of moisture in the air will both increase, thus leading to an increase in the severity of thunderstorms which can lead to derechos and tornadoes. Studies have shown that an increase in greenhouse gases in the atmosphere would significantly increase the number of days that severe thunderstorms occur in the southern and eastern United States (National Aeronautics and Space Administration [NASA] 2005).

Figure 4.3.11-5. Predicted Change in Severe Thunderstorm Environment Days from the 1962-1989 Period to the 2072-2099 Period



Source: Trapp et. al. 2007
Note: The approximate location of Passaic County is indicated by the black circle

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2019). Most of this warming has occurred since 1970. The State of New Jersey, for example, has observed an increase in average annual temperatures of 1.2°F between the period of 1971-2000 and the most recent decade of 2001-2010 (CATF 2011). Winter temperatures across the Northeast have seen an increase in average temperature of 4°F since 1970 (Northeast Climate Impacts Assessment [NECIA] 2007). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2013).

4.3.12 Vulnerability Assessment

A qualitative assessment was conducted to analyze the severe weather hazard for Passaic County. A probabilistic assessment was conducted for the 100- and 500-year MRPs to analyze the severe storm hazard and provide a range of loss estimates. These estimates are detailed in Section 4.3.1 (Coastal Storm).

Impact on Life, Health and Safety

The impact of severe weather events on life, health, and safety is dependent upon several factors including the severity of the event and whether adequate warning time was provided to residents. The entire population of Passaic County (510,562 people) is exposed to severe weather events (2013-2017 American Community Survey 5-Year Population Estimate).

Lightning can be responsible for deaths, injuries, and property damage. Lightning-based deaths and injuries typically involve heart damage, inflated lungs, or brain damage, as well as loss of consciousness, amnesia, paralysis, and burns, depending on the severity of the strike. Additionally, most people struck by lightning survive, although they may have severe burns and internal damage. People located outdoors (i.e., recreational activities and farming) are considered most vulnerable to hailstorms, thunderstorms, and tornadoes because there is little to no warning, and shelter might not be available. Moving to a lower risk location will decrease a person's vulnerability.

As a result of severe storm events, residents can be displaced or require temporary to long-term sheltering. In addition, downed trees, damaged buildings, and debris carried by high winds from hurricanes, tropical storms, or tornadoes can lead to injury or loss of life. Socially vulnerable populations are most susceptible, based on several factors, including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing.

Economically disadvantaged populations are more vulnerable because they often evaluate evacuation needs and make decisions based on the economic impact to their family. The population over the age of 65 (69,429 persons) is also vulnerable, can physically have difficulty evacuating, and are more likely to seek or need medical attention, which may not be available due to isolation during a storm event (2013-2017 American Community Survey 5-Year Population Estimate). Furthermore, the Centers for Disease Control and Prevention's (CDC) 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. Passaic County's overall score is 0.7768, indicating that its communities have high social vulnerability (CDC 2016). The category ranked highest in vulnerability is housing and transportation. If evacuation is necessary during a severe weather event, transportation options may be limited to the community.

Section 3 (County Profile) provides for the statistics for these populations in Passaic County. Refer to Section 4.3.1 (Coastal Storm) for more details regarding wind-related impacts on Passaic County's population.

Impact on General Building Stock

Damage to buildings depends on several factors, including the type of event, wind speed, presence and size of hail, storm duration, path of the storm track or tornado, and distance from the tornado funnel. Historically, the type of severe weather event that occurs most often is thunderstorms; refer to Table 4.3.11-3 for a summary of event types and damages. This is followed by heavy rain events and hail events. The latter two severe weather events do not have recorded property damages.

Less frequent but more damaging severe weather events have taken place between 1950 and 2019 in Passaic County. Three tornado events have been recorded to occur in Passaic County within this time period with property damages valued at approximately $2.55 million (NOAA 2020). Lightning can spark wildfires or building fires, especially if structures are not protected by surge protectors on critical electronic, lighting, or information technology systems. Thirteen separate lightning events have been recorded to occur in Passaic County between 1950 and 2018 (NOAA 2020). These events caused a total of $8.12 million worth of property damages. Refer to Section 4.3.1 (Coastal Storm) for more details regarding wind-related impacts on Passaic County's building stock and critical facilities.

Impact on Critical Facilities

Utility infrastructure could suffer damage from high winds associated with falling tree limbs or other debris, resulting in the loss of power or other utility service. Loss of service can impact residents, critical facilities, and business operations alike. Interruptions in heating or cooling utilities can affect populations, such the young and elderly, who are particularly vulnerable to temperature-related health impacts. Loss of power can also impact

other public utilities, including potable water, wastewater treatment, and communications. Lack of power to emergency facilities, including police, fire, EMS, and hospitals, will inhibit a community's ability to effectively respond to an event and maintain the safety of its residents.

Impact on Economy

As discussed, severe storm events can impact structures and the economy. Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Evacuation routes within the County may be impacted where severe weather causes an excessive amount of debris or infrastructure destruction. Utility infrastructure (power lines, gas lines, electrical systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and can impact heating or cooling provision to the population.

The cost of these severe weather impacts can strain the local economy. Costs from damages can add up for severe weather events such as tornados destroying key infrastructure and level local businesses, or extreme rain events flooding out shopping centers or transportation hubs. As highlighted in Table 4.3.11-3, several severe weather events have historically caused tens of thousands to hundreds of thousands of dollars in damages. Refer to the Section 4.3.1 (Coastal Storm) for additional impacts on the economy as a result of severe weather events.

Impact on the Environment

The impact of severe weather events on the environment varies, but researchers are finding that the long-term impacts of more severe weather can be destructive to the natural and local environment. National organizations such as USGS and NOAA have been studying and monitoring the impacts of extreme weather phenomena on streamflow, river levels, reservoir elevations, rainfall, floods, landslides, erosion, etc. (USGS 2017). Researchers are predicting that landscapes will continue to extensively transform, changing the natural habitat. For example, severe weather that creates longer periods of rainfall can erode shorelines and riverbanks and degrade soil stability for terrestrial species. Tornadoes can tear apart habitats causing fragmentation across ecosystems. Researchers also believe that a greater number of diseases will spread across ecosystems because of impacts that severe weather and climate change will have on water supplies (NOAA 2013c). Overall, as the physical environment becomes more altered, species will begin to contract or migrate in response, which may cause additional stressors to the entire ecosystem within Passaic County.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Passaic County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

As discussed in Section 3 (County Profile), areas targeted for future growth and development have been identified across Passaic County. Any areas of growth could be potentially impacted by the severe storm hazard because the entire County is exposed and vulnerable. However, due to increased standards and codes, new development may be less vulnerable to the severe storm hazard compared with the aging building stock in the County.

Projected Changes in Population

Passaic County has experienced population growth since 2010. Overall with the projected increase in population, aging population and aging infrastructure, there may be increased stress on existing infrastructure and related services as a result of severe weather events.

Climate Change

As discussed earlier, studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. More frequent and severe storms will increase the County's vulnerability to each of the identified severe storm hazards. Section 4.3.7 (Flood) provides a discussion related to the impact of climate change due to increases in rainfall resulting from severe storms.

Change of Vulnerability

Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to severe weather events.

4.3.12 Severe Winter Weather

The following section provides the hazard profile and vulnerability assessment for the severe winter storm hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2014 and 2019.

4.3.12.1 Profile

Hazard Description

A winter storm is a weather event in which the main types of precipitation are snow, sleet or freezing rain. They can be a combination of heavy snow, blowing snow, and/or dangerous wind chills. There are three basic components needed to make a winter storm. Below freezing temperatures (cold air) in the clouds and near the ground are necessary to make snow and ice. Lift, something to raise the moist air to form clouds and cause precipitation, is needed. Examples of this is warm air colliding with cold air and being forced to rise over the cold dome or air flowing up a mountainside. The last thing needed to make a winter storm is moisture to form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean (National Severe Storms Laboratory 2014).

Some winter storms are large enough to immobilize an entire region while others may only affect a single community. Winter storms are typically accompanied by low temperatures, high winds, freezing rain or sleet, and heavy snowfall. The aftermath of a winter storm can have an impact on a community or region for days, weeks, or even months; potentially causing cold temperatures, flooding, storm surge, closed and/or blocked roadways, downed utility lines, and power outages. In Passaic County, winter storms include blizzards, snow storms and ice storms. Nor'Easters are also a common type of storm that may occur during winter months within the State of New Jersey; however, given the frequency of these types of storms in the State and their severe potential impact, Nor'Easters are considered by the Planning Committee as a separate hazard and are further discussed in Section 4.3.1 (Coastal Storms) within this plan. Extreme cold temperatures and wind chills are also associated with winter storms; however, based on input from the County and Planning Committee, these events are further discussed in this Plan in Section 4.3.6 (Extreme Temperatures).

Heavy Snow

According to the National Snow and Ice Data Center (NSIDC), snow is precipitation in the form of ice crystals. It originates in clouds when temperatures are below the freezing point (32 degrees Fahrenheit [°F]), when water vapor in the atmosphere condenses directly into ice without going through the liquid stage. Once an ice crystal has formed, it absorbs and freezes additional water vapor from the surrounding air, growing into snow crystals or snow pellets, which then fall to the earth. Snow falls in different forms, such as snowflakes, snow pellets, or sleet. Snowflakes are clusters of ice crystals that form from a cloud. Snow pellets are opaque ice particles in the atmosphere. They form as ice crystals fall through super-cooled cloud droplets that are below freezing but remain a liquid. The cloud droplets then freeze to the crystals. A heavy snowstorm is defined as a snowstorm with accumulations of 4 inches or more of snow in a 6-hour period, or 6 inches of snow in a 12-hour period (NWS 2009).

Blizzards

A blizzard is a winter snowstorm with sustained or frequent wind gusts of 35 mph or more, accompanied by falling or blowing snow reducing visibility to or below 0.25 mile. These conditions must be the predominant over a 3-hour period. Extremely cold temperatures are often associated with blizzard conditions, but are not a formal part of the definition. The hazard, created by the combination of snow, wind, and low visibility, significantly increases when temperatures are below 20°F. A severe blizzard is categorized as having temperatures near or below 10°F, winds exceeding 45 mph, and visibility reduced by snow to near zero. Storm systems powerful enough to cause blizzards usually form when the jet stream dips far to the south, allowing cold air from the north to clash with warm, moister air from the south. Blizzard conditions often develop on the northwest side of an intense storm system. The difference between the lower pressure in the storm and the higher pressure to the west creates a tight pressure gradient, resulting in strong winds and extreme conditions caused by the blowing snow (The Weather Channel 2012).

Ice Storms

An ice storm describes those events when damaging accumulations of ice are expected during freezing rain situations. Significant ice accumulations are typically accumulations of ¼" or greater (NWS 2013). Heavy accumulations of ice can bring down trees, power lines and utility poles, and communication towers. Ice can disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians (NWS 2008).

Location

Snow and Blizzards

The trajectory of the storm center—whether it passes close to the New Jersey coast or at a distance—largely determines both the intensity and the duration of the snowfall over the State. Winter storms tend to have the heaviest snowfall within a 150-mile wide swath to the northwest of what are generally southwest to northeast moving storms. Depending on whether all or a portion of New Jersey falls within this swath, the trajectory determines which portion of the State (or all of the State) receives the heaviest amount of snow. According to the ONJSC, Passaic County's normal seasonal snowfall is approximately 43-47 inches.

Ice Storms

All regions of New Jersey are subject to ice storms. The distribution of ice storms often coincides with general distribution of snow within several zones in the State. A cold rain may be falling over the southern portion of the State, freezing rain over the central region, and snow over the northern counties as a coastal storm moves northeastward offshore. A locality's distance to the passing storm center is often the crucial factor in determining the temperature and type of precipitation during a winter storm. Based on data from 1948–2000, Passaic County can anticipate 3-4 days with freezing rain per year (Changnon & Karl 2003). Based on data from 1932–2001, the County can anticipate 6-9 total hours of freezing rain per year (Changnon 2004).

Extent

The magnitude or severity of a severe winter storm depends on several factors, including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day (for example, weekday versus weekend), and time of season. While sleet accumulation is measured and tracked in a method similar to snow events, the extent or severity of freezing rain or an ice storm requires a different and sometimes more challenging process. According to NWS, ice accumulation does not coat the surface of an object evenly, as gravity typically forces rainwater to the underside of an object before it freezes. Wind can also force rainwater downward prior

to freezing, resulting in a thicker coating of ice on one side of the object than the other side. Ice mass is then determined by taking the average from the thickest and thinnest portions of ice on the sample used for measurement.

The National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) produces the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from Category 1 to 5, which is similar to the Enhanced Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. RSI is based on the spatial extent of the storm, the amount of snowfall, and the combination of the extent and snowfall totals with population (based on the 2000 Census). The NOA NCEI has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCEI 2020). Table 4.3.12-1 explains the five RSI ranking categories.

Table 4.3.12-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Source: NOAA-NCEI 2020
Note: RSI = Regional Snowfall Index

NWS operates a widespread network of observation systems, such as geostationary satellites, Doppler radars, and automated surface observing systems that feed into the current state-of-the-art numerical computer models to provide a look into future weather, ranging from hours to days. The models are then analyzed by NWS meteorologists who then write and disseminate forecasts (NWS 2013). While winter weather is normal during the winter season for Passaic County, the NWS uses winter weather watches, warnings, and advisories to help people anticipate what to expect in the days and hours prior to an approaching storm.

- A ***winter storm watch*** is issued when severe winter conditions (heavy snow, ice, etc.) may affect a certain area, but its occurrence, location, and timing are uncertain. A watch is issued to provide 24 to 72 hours of notice of the possibility of severe winter weather.
- A ***winter storm warning*** is issued when hazardous winter weather, in the form of heavy snow, heavy freezing rain, or heavy sleet, is imminent or occurring. A warning is usually issued 12 to 24 hours before the event is expected to begin.
- A ***winter weather advisory*** is issued when a hazardous winter weather event is occurring, is imminent, or has a greater than 80 percent chance of occurrence. Advisories are used to inform people that winter weather conditions are expected to cause significant inconveniences and that conditions may be hazardous. These conditions may refer to sleet, freezing rain, or ice storms, in addition to snow events.
- NWS may also issue a ***blizzard warning*** when snow and strong winds combine to produce the potential for blinding snow, deep drifts, and wind chill (NWS n.d.).

Previous Occurrences and Losses

Many sources have provided historical information regarding previous occurrences and losses associated with severe winter storm events in Passaic County. According to the NOAA-NCEI Storm Events Database, Passaic County experienced 89 winter weather events between 1950 and 2019, including 48 heavy snow events, four ice storms, 22 winter storms, and 12 winter weather events. The table below shows these statistics (NOAA NCEI 2018). No events resulted in deaths, injuries, property damages, or crop damages.

Table 4.3.12-2. Severe Winter Weather Events in Passaic County 1950 to 2019

Hazard Type	Number of Occurrences Between 1950 and 2019	Total Fatalities	Total Injuries	Total Property Damage ($)	Total Crop Damage ($)
Blizzard	3	0	0	$0	$0
Heavy Snow	48	0	0	$0	$0
Ice Storm	4	0	0	$0	$0
Sleet	0	0	0	$0	$0
Winter Storm	22	0	0	$0	$0
Winter Weather	12	0	0	$0	$0
Total	**89**	**0**	**0**	**$0**	**$0**

Note: Not all events that have occurred in Passaic County are included due to the extent of documentation and the fact that not all sources have been identified or researched.
Source: NOAA-NCEI 2020

Between 1954 and 2019, the Federal Emergency Management Agency (FEMA) included Passaic County in one winter storm-related DR or EM declarations classified as one or a combination of the following disaster types: severe winter storm, snowstorm, snow, ice storm, winter storm, and blizzard.

Table 4.3.12-2. Severe Winter Weather-Related Disaster (DR) and Emergency (EM) Declarations 1954-2019

Declaration	Event Date	Declaration Date	Event Description
DR-1954	December 26, 2010 – December 27, 2010	February 4, 2011	Snow: Severe Winter Storm and Snowstorm

Source: FEMA 2019

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2012 and 2019, Passaic County was included in four USDA declarations related to severe winter weather.

Table 4.3.12-3. Severe Winter Weather-Related USDA Disaster Declarations 2012-2019 for Passaic County

Declaration	Event Date	Declaration Date	Event Description
S3593	May 1, 2013 – Continuing	October 1, 2013	Hail
S3249	March 1, 2012 – Continuing	June 5, 2012	Frosts and Freezes
S3251	March 26, 2012 – April 8, 2012	June 5, 2012	Frosts, Freezes, and Hail
S3487	June 28, 2012 – November 8, 2012	February 14, 2013	Hail, Snowstorm, and Nor'Easter

Source: USDA 2019

Severe Winter Storm Events

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events database records and defines severe winter storm events as follows:

- Blizzard is reported in the NOAA-NCEI database when a winter storm which produces the following conditions for 3 consecutive hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile.
- Heavy snow is reported in the NOAA-NCEI database whenever snow accumulation meets or exceed locally/regionally defined 12 and/or 24-hour warning criteria.
- Ice storm is reported in the NOAA-NCEI database when ice accretion meets or exceed locally/regionally defined warning criteria (typical value is 1/4 or 1/2 inch or more).
- Sleet is reported in the NOAA-NCEI database whenever sleet accumulations meet or exceed locally/regionally defined warning criteria (typical value is ½ inch or more).
- Winter storm is reported in the NOAA-NCEI database whenever a winter weather event has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24 hour warning criteria for at least one of the precipitation elements.
- Winter weather is reported in the NOAA-NCEI database when a winter precipitation event causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria.

Table 4.3.12-4 includes winter storm events and FEMA disaster declarations that occurred between 2014 and 2019.

Table 4.3.12-4. Severe Winter Weather Events in Passaic County, 2014 to 2019

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Location	Description
March 3, 2019	Heavy Snow	N/A	N/A	Western Passaic	Low pressure developed across the southeast on Sunday March 3, 2019 and then tracked off the Middle Atlantic coast early on Monday March 4, 2019. The low moved just inside the 40N/70W benchmark and continued out to sea. The low brought a widespread snowfall to northeast New Jersey with the heaviest accumulations occurring across the interior. Much of the significant snow occurred overnight with improved conditions during the Monday morning commute.
March 6 – March 7, 2018	Severe Storm and Snowstorm	DR-4368	Yes	Countywide	Precipitation gradually overspread the region during the overnight hours of March 6th to the 7th. The snow contained large amounts of liquid, making it heavy and wet. This resulted in downed trees, limbs, and wires, leading to numerous power outages across portions of New Jersey, especially where the heaviest snow was reported. Many customers were still without power from the previous storm when this storm struck. Governor Murphy estimated about 350,000 customers state-wide lost power as a result of this second storm. Governor Phil Murphy declared a state of emergency which went into effect at 8 PM Tuesday March 6th. Flights were cancelled at all the major airports due to the storm, and Amtrak cancelled at least some Wednesday service.
February 17, 2018	Heavy Snow	N/A	N/A	Eastern and Western Passaic	A low pressure developed along a frontal boundary along the southeast coast on the evening of Saturday, February 17, 2018. This low gradually became better organized as it moved up the coast early Sunday, February 18, 2018. This system brought heavy snow to northern portions of northeast New Jersey.
March 14, 2017	Blizzard	N/A	N/A	Western Passaic	Rapidly deepening low pressure tracked up the eastern seaboard on Tuesday March, 14 bringing blizzard conditions to Western Passaic county. Heavy snow and sleet along with strong winds occurred across the rest of Northeast New Jersey. The storm cancelled numerous flights at Newark airport with some mass transit services suspended. Large trees fell onto homes in Bergen county and approximately 4,500 power outages resulted from the strong winds and heavy snow.
February 1, 2015	Heavy Snow	N/A	N/A	Eastern Passaic	An area of low pressure tracked east from the Ohio Valley the night of February 1 to just south of Long Island the afternoon of February 2. The proximity of the low with arctic air to the north resulted in snow at the onset, which transitioned to a wintry mix during the morning hours before going back to snow by early afternoon. Northeast New Jersey received 5 to 12 inches of snowfall and up to a third of an inch of ice.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Location	Description
January 24, 2015	Heavy Snow	N/A	N/A	Eastern and Western Passaic	Low pressure moved out of the northern Gulf of Mexico on the morning of the 23rd, to the Mid Atlantic coast on the morning of the 24th, then rapidly intensified on its way northeast to the Canadian Maritimes the following day. This low brought heavy snow to parts of northeast New Jersey on the 24th.
November 26, 2014	Heavy Snow	N/A	N/A	Western Passaic	Low pressure developed during the late evening hours on November 25th across northern Florida, and quickly raced along the Eastern seaboard on the 26th, bringing heavy snow along and northwest of the Interstate 287 corridor of interior Northeast New Jersey, and disrupting travel plans the day before Thanksgiving Day.
February 5, 2014	Heavy Snow	N/A	N/A	Western Passaic	A complex low-pressure system moving through the Ohio Valley and Mid-Atlantic regions brought a quick burst of moderate to heavy snow, sleet, and freezing rain to Northeast New Jersey the morning of February fifth.
February 3, 2014	Heavy Snow	N/A	N/A	Western Passaic	Weak low pressure passing to the south brought heavy snow to Northeast New Jersey on the third.
January 21, 2014	Heavy Snow	N/A	N/A	Eastern Passaic	Low pressure moving from the central Appalachians the morning of the 21st intensified off the Mid Atlantic coast and brought heavy snow to most of northeast New Jersey.
January 2, 2014	Heavy Snow	N/A	N/A	Western Passaic	A low-pressure system moving into the Ohio Valley on January 2 redeveloped and intensified along the Mid Atlantic coast, bringing heavy snow to Northeast New Jersey before moving out to sea on the third of January.

Source: NOAA-NCEI 2019; NJOEM 2019; NWS 2020; FEMA 2020
DR Disaster Declaration
FEMA Federal Emergency Management Agency
N/A Not Applicable
NOAA National Oceanic and Atmospheric Administration
NWS National Weather Service

Probability of Future Occurrences

Passaic County is estimated to continue experiencing direct and indirect impacts of severe winter storms annually. Table 4.3.12-5 provides the probability of occurrences of severe winter storm events. However, the information used to calculate the probability of occurrences is only based on NOAA-NCEI storm events database results.

Table 4.3.12-5. Severe Winter Storm Events in Passaic County 1950 to 2019

Hazard Type	Number of Occurrences Between 1950 and 2019	Rate of Occurrence	Recurrence Interval	Probability of Event Occurring in Any Given Year	% Chance of Event Occurring in Any Given Year
Blizzard	3	0.04	23.33	0.04	4.29
Heavy Snow	48	0.70	1.46	0.69	68.57
Ice Storm	4	0.06	17.50	0.06	5.71
Sleet	0	0	0	0	0
Winter Storm	22	0.32	3.18	0.31	31.43
Winter Weather	12	0.17	5.83	0.17	17.14
Total	**89**	**1.29**	**0.79**	**1.27**	**100**

Source: NOAA-NCEI 2020

Note: Probability was calculated using the available data provided in the NOAA-NCEI storm events database. Due to limitations in data, not all extreme temperature events occurring between 1950 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is under-estimated. A 100 percent chance of occurring means that at least one severe winter storm event, regardless of type, is likely to occur annually.

Although sleet events have occurred in the past in Passaic County, no sleet events were noted reaching the warning criteria threshold for reporting in the NOAA-NCEI database as singular events.

In Section 4.4 (Hazard Ranking), the identified hazards of concern for Passaic County are ranked using a variety of parameters. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee and Planning Committee, the probability of occurrence for severe winter storms in the County is considered "frequent".

Climate Change Impacts

In terms of snowfall and ice storms, there is a lack of quantitative data to predict how future climate change will affect this hazard. It is likely that the number of winter weather events may decrease, and the winter weather season may shorten; however, it is also possible that the intensity of winter storms may increase. The exact effect on winter weather is still highly uncertain (Sustainable Jersey Climate Change Adaptation Task Force 2013).

Temperatures in the Northeast United States have increased 1.5 degrees Fahrenheit (°F) on average since 1900. Most of this warming has occurred since 1970. The State of New Jersey, for example, has observed an increase in average annual temperatures of 1.2°F between the period of 1971-2000 and the most recent decade of 2001-2010 (ONJSC, 2011). Winter temperatures across the Northeast have seen an increase in average temperature of 4°F since 1970 (Northeast Climate Impacts Assessment [NECIA] 2007). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2013). Due to the increase in temperature, snow cover and sea ice extent are predicted to likely decrease over the next century and the snow season length is very likely to decrease over North America. However, warming of the lower atmosphere could potentially lead to more ice storms by allowing snow to more frequently melt as it falls and then refreeze near or at surface (NYCPCC 2010).

4.3.12.2 Vulnerability Assessment

All of Passaic County is vulnerable to severe winter storm events. The following subsections discuss Passaic County's vulnerability, in a qualitative nature, to the severe winter weather hazard.

Impact on Life, Health and Safety

The entire population of Passaic County (510,562 people) is exposed to severe winter storm events (American Community Survey 2017). The homeless and elderly are considered most susceptible to this hazard. The elderly are considered susceptible to this hazard due to their increased risk of injuries and death from falls and overexertion and/or hypothermia from attempts to clear snow and ice. According to the 2017 ACS 5-Year estimate, there are 69,429 persons over 65 years old that reside in the County that are considered vulnerable to severe winter weather. In addition, severe winter storm events can reduce the ability of these populations to access emergency services.

The homeless and residents below the poverty level may not have access to housing or their housing could be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). Residents with low incomes might not have access to housing or their housing can be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). In Passaic County, areas with the highest concentration of population below the poverty level are located in the Cities of Passaic and Paterson (33% and 29.1% of total populations, respectively). Refer to Section 3 (County Profile) that displays the densities of low-income populations in Passaic County.

According to the NOAA National Severe Storms Laboratory (NSSL); every year, winter weather indirectly and deceptively kills hundreds of people in the U.S., primarily from automobile accidents, overexertion and exposure. Winter storms are often accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, drifting snow and extreme cold temperatures and dangerous wind chill. They are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold. Heavy accumulations of ice can bring down trees and power lines, disabling electric power and communications for days or weeks. Heavy snow can immobilize a region and paralyze a city, shutting down all air and rail transportation and disrupting medical and emergency services. Storms near the coast can cause coastal flooding and beach erosion as well as sink ships at sea. The economic impact of winter weather each year is huge, with costs for snow removal, damage and loss of business in the millions (NSSL, 2018).

Impact on General Building Stock

The entire general building stock inventory is exposed and vulnerable to the severe winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. As an alternate approach, this plan considers percentage damages that could result from severe winter storm conditions. This allows planners and emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Table 4.3.12-6 below summarizes the estimated loss based on 1-, 5-, and 10-percent losses. Given professional knowledge and the currently available information, the potential loss for this hazard is many times considered to be overestimated because of varying factors (building structure type, age, load distribution, building codes in place, etc.). Therefore, the following information should be used as estimates only for planning purposes with the knowledge that the associated losses for severe winter storm events vary greatly.

Table 4.3.12-6. General Building Stock Exposure and Estimated Losses from Severe Winter Storm Events

Municipality	Total (All Occupancies)	1% Damage Loss Estimate	5% Damage Loss Estimate	10% Damage Loss Estimate
Bloomingdale, Borough of	$1,784,142,939	$17,841,429	$89,207,147	$178,414,294

Table 4.3.12-6. General Building Stock Exposure and Estimated Losses from Severe Winter Storm Events

Municipality	Total (All Occupancies)	1% Damage Loss Estimate	5% Damage Loss Estimate	10% Damage Loss Estimate
Clifton, City of	$21,649,495,205	$216,494,952	$1,082,474,760	$2,164,949,520
Haledon, Borough of	$1,708,591,489	$17,085,915	$85,429,574	$170,859,149
Hawthorne, Borough of	$4,588,063,085	$45,880,631	$229,403,154	$458,806,309
Little Falls, Township of	$4,633,701,650	$46,337,016	$231,685,082	$463,370,165
North Haledon, Borough of	$2,317,277,271	$23,172,773	$115,863,864	$231,727,727
Passaic, City of	$11,948,345,444	$119,483,454	$597,417,272	$1,194,834,544
Paterson, City of	$55,984,762,201	$559,847,622	$2,799,238,110	$5,598,476,220
Pompton Lakes, Borough of	$1,853,779,603	$18,537,796	$92,688,980	$185,377,960
Prospect Park, Borough of	$709,318,581	$7,093,186	$35,465,929	$70,931,858
Ringwood, Borough of	$2,724,021,483	$27,240,215	$136,201,074	$272,402,148
Totowa, Borough of	$6,476,350,669	$64,763,507	$323,817,533	$647,635,067
Wanaque, Borough of	$2,211,149,264	$22,111,493	$110,557,463	$221,114,926
Wayne, Township of	$19,125,773,073	$191,257,731	$956,288,654	$1,912,577,307
West Milford, Township of	$9,348,319,367	$93,483,194	$467,415,968	$934,831,937
Woodland Park, Borough of	$17,134,672,551	$171,346,726	$856,733,628	$1,713,467,255
Passaic County (Total)	**$164,197,763,874**	**$1,641,977,639**	**$8,209,888,194**	**$16,419,776,387**

Source: Passaic County, RS Means 2019

A specific area that is vulnerable to the severe winter storm hazard is the floodplain. Severe winter storms can cause flooding through blockage of streams or through snow melt. At-risk residential infrastructures are presented in the flood hazard profile (Section 4.3.7). Generally, losses resulting from flooding associated with severe winter storms should be less than that associated with the 1-percent annual chance flood. Please refer to the Coastal Storm (Section 4.3.1) and Severe Weather (Section 4.3.11) profiles for losses resulting from wind.

Impact on Critical Facilities

Full functionality of critical facilities such as police, fire and medical facilities is essential for response during and after a severe winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended. Infrastructure at risk for this hazard includes roadways that could be damaged due to the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires the clearing roadways and alerting citizens to dangerous conditions; following the winter season, resources for road maintenance and repair are required.

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces (NSSL 2006).

Impact on Economy

The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. Impacts on the economy also include commuter difficulties into or out of the area for work or school. The loss of power and closure of roads prevent commuters from traveling within the County. In 2016, 23 states within the US spent over $1.1 billion in winter maintenance costs (The Weather Channel 2016). During the 2018-2019 winter season, the State of New Jersey Department of Transportation has budgeted winter maintenance expenditures at $95.1 million, which includes costs for salt (284,423 tons), liquid calcium chloride (614,153 gallons), and brine (1,993,552 gallons) (NJDOT 2019).

Impact on the Environment

Severe winter weather can have a major impact on the environment. Not only does winter weather create changes in natural processes, the residual impacts of a community's methods to maintain its infrastructure through winter weather maintenance may also have an impact on the environment. For example, an excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (USGS nd). Rain-on-snow events can also exacerbate runoff rates with warming winter weather. Consequentially, these flow rates and excess volumes of water can erode banks, tear apart habitat along the banks and coastline, and disrupt terrestrial plants and animals.

Furthermore, chemically based winter maintenance practices have its own effect on the natural environment. Melting snow and ice that carry deicing chemicals onto vegetation and into soils can contaminate the local waterways. Elevated salt levels may hinder vegetation from absorbing nutrients, slowing plant growth (The Environmental Literacy Council 2015).

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensure that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that can affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

Areas targeted for future growth and development have been identified across Passaic County (refer to Sections 3 and 9). Any areas of growth could be potentially impacted by the severe winter storm hazard because the entire planning area is exposed and vulnerable. However, due to increased standards and codes, new development may be less vulnerable to the severe winter weather hazard compared with the aging building stock in the County.

Projected Changes in Population

As discussed in Section 3 (County Profile), the Passaic County population has been increasing and is projected to continue to increase in coming decades. In addition, the population is aging. As the aging population grows, so too will the number of persons vulnerable to severe winter weather and extreme cold temperatures.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the

prevalence and severity of extreme events such as winter storms. While predicting changes of winter storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA], 2006).

Both northern and southern New Jersey have become wetter over the past century. Northern New Jersey's 1971-2000 precipitation average was over five inches (12%) greater than the average from 1895-1970. Southern New Jersey became two inches (5%) wetter late in the 20th century (Office of New Jersey State Climatologist). In terms of snowfall and ice storms in New Jersey, there is a lack of quantitative data to predict how future climate change will affect this hazard. It is likely that the number of winter weather events may decrease, and the winter weather season may shorten; however, it is also possible that the intensity of winter storms may increase. The exact effect on winter weather is still highly uncertain (Sustainable Jersey Climate Change Adaptation Task Force 2013).

An increase in the frequency and severity of severe winter storms could result in an increase of snow loads on the County's building stock and infrastructure, putting each building at risk to structural damage. More frequent and severe events also will result in increased resources spent to prepare for and clean-up after an event. However, as winter temperatures continue to rise, climate projections indicate the increase in precipitation is likely to occur during the winter months as rain. Increased rain on snowpack or frozen or saturated soils can lead to increased flooding and related impacts on the County's assets.

Vulnerability Change Since the 2015 HMP

Overall, the County's exposure and vulnerability have not changed, and the entire County will continue to be exposed and vulnerable to severe winter storm events.

4.3.13 Wildfire

The following section provides the hazard profile and vulnerability assessment for the wildfire hazard in Passaic County.

2020 HMP Changes

- Previous occurrences were updated with events that occurred between 2014 and 2019.
- The vulnerability assessment was conducted using updated population, building and critical facility/lifeline spatial data to determine exposure to the wildfire hazard.

4.3.13.1 Profile

Hazard Description

A wildland fire can be defined as any non-structural fire that occurs in the wildland. Three distinct types of wildland fires have been defined and include: naturally occurring wildfire, human-caused wildfire, and prescribed fire. Many of these are highly destructive and can be difficult to control. They occur in forested, semi-forested, or less developed areas. Wildland fires can be caused by lightning, human carelessness, and arson. Most frequently, wildland fires in the State of New Jersey are caused by humans. Wildfires result in the uncontrolled destruction of forests, brush, field crops, grasslands, real estate, and personal property, and have secondary impacts on other hazards such as flooding, by removing vegetation and destroying watersheds.

Wildfires can increase the probability of other natural disasters, specifically floods and mudflows. Wildfires, particular large-scale fires, can dramatically alter the terrain and ground conditions, making land already devastated by fire susceptible to floods. Lands impacted by wildfire increase the risk of flooding and mudflow in those areas impacted by wildfire. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water; thus, creating conditions perfect for flash flooding and mudflows. Flood risk in these impacted areas remain significantly higher until vegetation is restored, which can take up to five years after a wildfire (FEMA 2019).

Flooding after a wildfire is often more severe, as debris and ash left from the fire can form mudflows. During and after a rain event, as water moves across charred and denuded ground, it can also pick up soil and sediment and carry it in a stream of floodwaters. These mudflows have the potential to cause significant damage to impacted areas. Areas directly affected by fires and those located below or downstream of burn areas are most at risk for flooding (FEMA 2019). For detailed information regarding flooding, see Section 4.3.7 (Flood).

The height of wildland fire season in New Jersey is typically in spring (March through May) and culminates in early May, corresponding with the driest live fuel moisture periods of the year. Although the spring months are the most severe, the summer and fall months may also experience extensive fires in the state. While the spring season is historically the period in which wildfire danger is the highest, wildland fires can occur every month of the year. Drought, snowpack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires. Lightning generally is the cause of most fires in the peak season.

In the State of New Jersey, each year an average of 1,500 wildfires damage or destroy 7,000 acres of the state's forests. Wildfires not only damage woodlands, but threaten homeowners who live within or adjacent to forest environments. From January 1, 2018, to August 12, 2018, there were 552 wildfires in New Jersey that burned over 1,300 acres. In contrast, during this same period in 2017, the State experienced 588 fires, which burned over 5,024 acres (NJDEP 2018).

Location

According to the U.S. Fire Administration (USFA), the fire problem in the U.S. varies from region to region. This often is a result of climate, poverty, education, demographics, and other causal factors (USFA, 2012). Wildfires occur in virtually all of the U.S. The western portion of the U.S. is subject to more frequent wildfires, due to their more arid climate and prevalent conifer and brush fuel types. Wildfires have proven to be the most destructive in California but have become an increasingly frequent and damaging phenomenon nationwide (FEMA, 1997).

NJFFS, a division of the New Jersey Department of Environmental Protection (NJDEP), is responsible for protecting the 3.25 million acres of wildland in the State. NJFFS is under the direction of the State fire warden and is headquartered in Trenton. NJFFS has 85 full-time employees that provide an array of services including staffing the State's 21 fire towers, which are operational during the months of March, April, May, October, and November.

NJFFS divides the State into three regions (Northern, Central, Southern) each totaling about 1,250,000 acres. There are 29 125,000 acre sections with a dedicated forest fire warden in each; and 269 districts each consisting of 15,000-20,000 acres In total, 29 section forest fire wardens, 269 district forest fire wardens and 2,000 trained crew members respond to fires on an as-needed basis (NJFFS 2020). Passaic County is located in Division A (Northern NJ).

Wildfire Fuel Hazard Areas

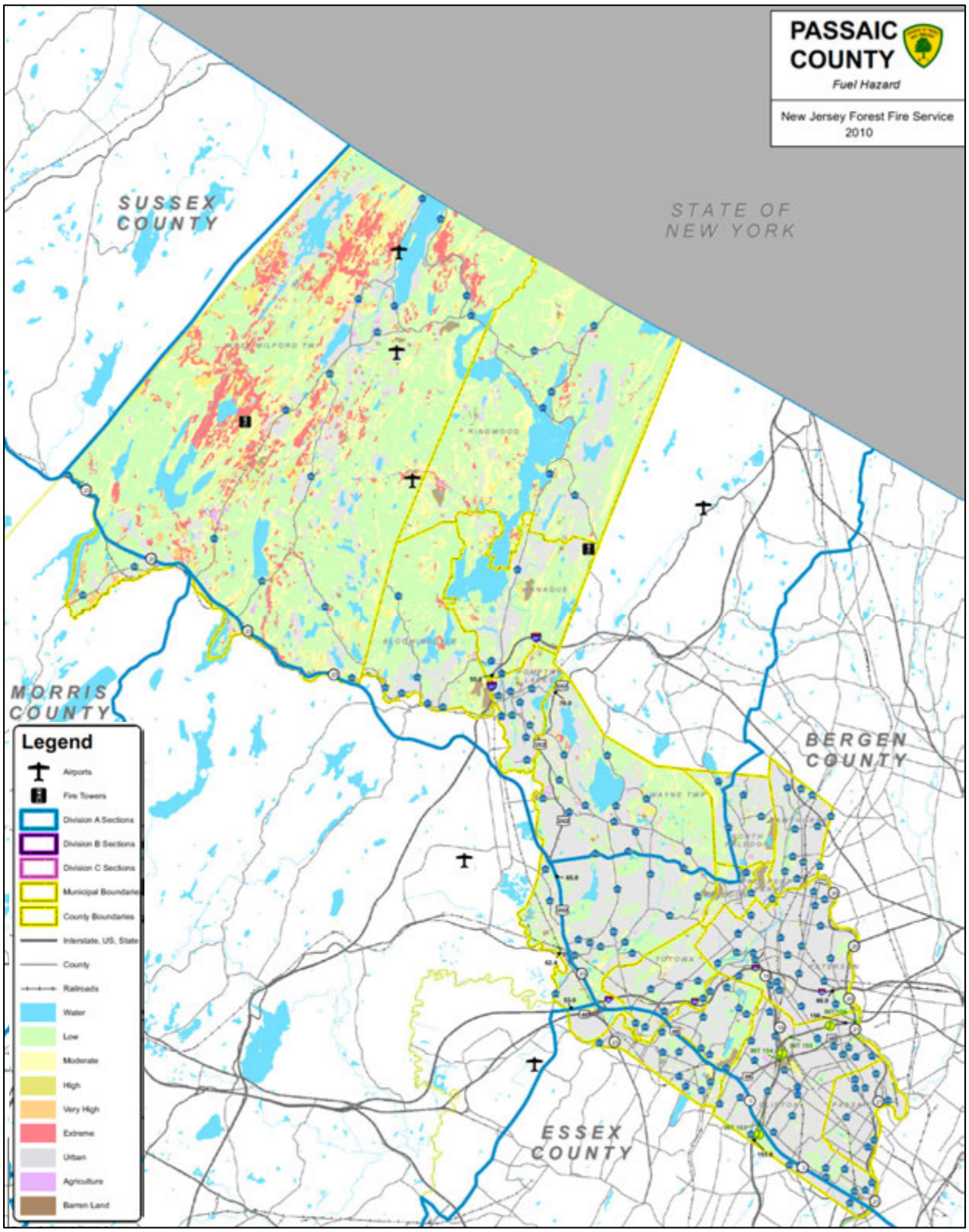
NJFFS developed Wildfire Fuel Hazard data for the entire state based on NJDEP data. For details on the information was developed, refer to: https://www.state.nj.us/dep/gis/njfh.html. Figure 4.3.13-1 and Figure 4.3.13-2 illustrate the wildfire fuel hazard and wildfire risk for Passaic County. Generally, wildfires in Passaic County are more likely to occur in the north and northwestern portions of the County, as compared to the more urban communities in the south. Table 4.3.13-1 indicates the amount of land in each of the wildfire fuel hazard ranking zones for Passaic County. Table 4.3.13-2 summarizes the approximate area in the NJFFS risk areas in the County.

Table 4.3.13-1. Area in the Wildfire Fuel Hazard Ranking Zones in Passaic County

Hazard Area	Area (Square Miles)
Extreme	8.67
Very High	1.48
High	5.41
Moderate	24.14
Low	78.50

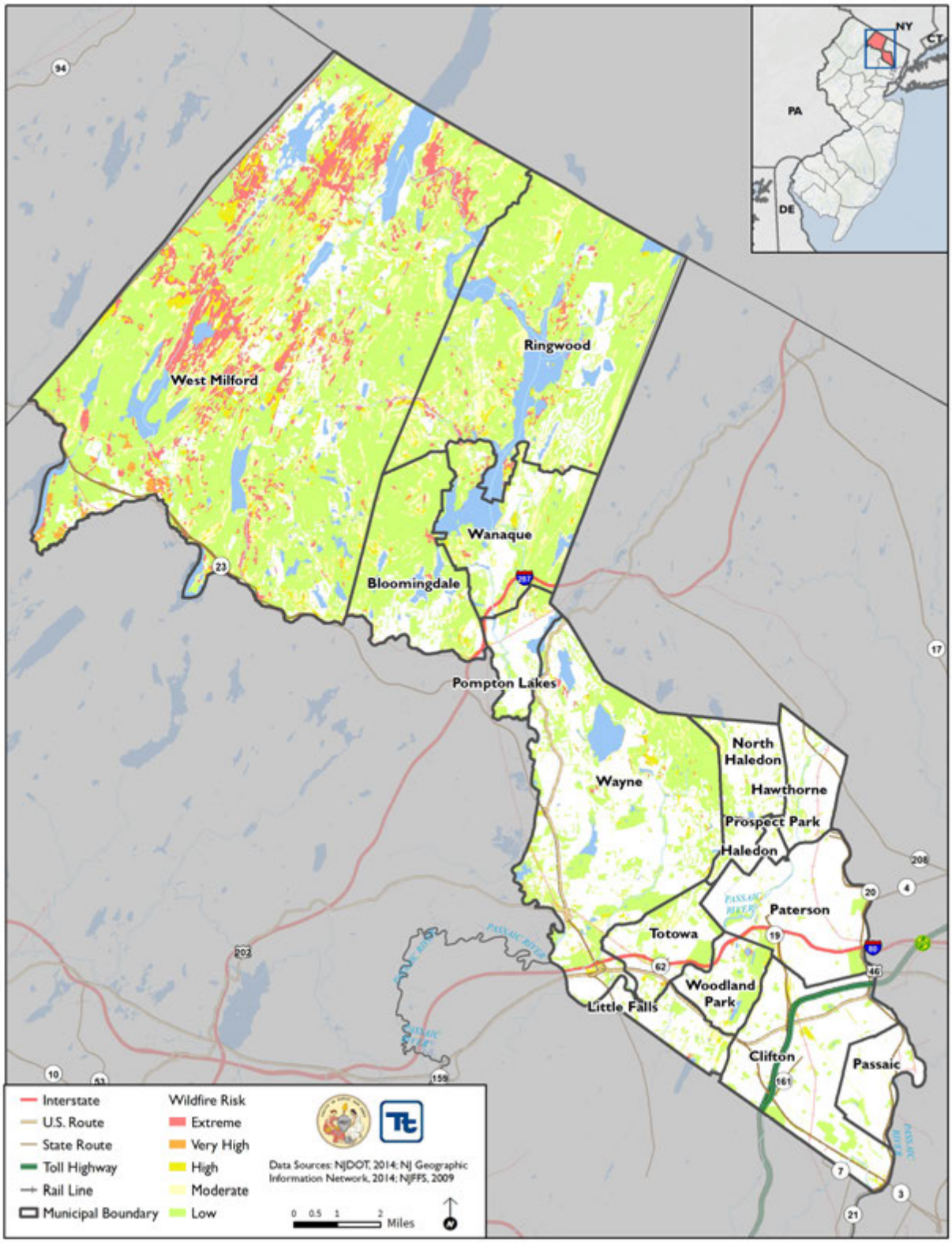
Source: NJFFS 2013

Figure 4.3.13-1. Wildfire Fuel Hazard for Passaic County



Source: NJFFS 2010

Figure 4.3.13-2. Wildfire Risk for Passaic County



Extent

The extent (that is, magnitude or severity) of wildfires depends on weather (dryness/drought) and human activity. To determine the potential for wildfires, the NJFFS uses two indices to measure and monitor the dryness of forest fuels and the possibility of fire ignitions becoming wildfires. This includes the National Fire Danger Rating Systems Buildup Index and the Keetch-Byram Drought Index. Both are used for fire preparedness planning, which includes the following initiatives: campfire and burning restrictions, fire patrol assignments, staffing of fire lookout towers, and readiness status for both observation and firefighting aircraft.

- The ***Buildup Index*** is a number that reflects the combined cumulative effects of daily drying and precipitation fuels with a 10-day time lag constant. It is a rating of the total amount of fuel available for combustion.
- The ***Keetch-Byram Drought Index*** (KBDI) is an index used to determining forest fire potential. The drought index is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

In addition to the two indices, the NJFFS uses the National Fire Danger Rating System (NFDRS) to provide a measure of relative seriousness of burning conditions and threat of fire in the State. It allows the NJFFS to estimate the daily fire danger for a given area. The NFDRS uses a five-color coded system to help the public understand fire potential. The NJFFS slightly adapted the color system for their purposes. The NFDRS, with the NFFS color scheme, is as follows in Table 4.3.13-3:

Table 4.3.13-3. Fire Danger Rating and Color Code

Fire Danger Rating and Color Code	Description
Low (L) (Dark Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Light Green or Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open-cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash (trunks, branches, and tree tops) or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Source: NJFFS 2014

Previous Occurrences and Losses

Between 1954 and 2019, New Jersey was included in two FEMA fire management assistance (FMA) declarations. Generally, these disasters cover a wide range of the state; therefore, the disaster may have impacted many counties. Passaic County was not included in either of these FMA declarations.

Passaic County was also not included in any U.S. Department of Agriculture declarations for the wildfire hazard. Based on all sources used to research and identify wildfires in the County, there have been no wildfire incidents in Passaic County between 2014 and 2019, other than brush fires that were controlled.

Probability of Future Occurrences

Estimating the approximate number of wildfires to occur in Passaic County is difficult to predict in a probabilistic manner. This is because a number of variable factors impact the potential for a fire to occur and because some conditions (for example, ongoing land use development patterns, location, fuel sources, and construction sites) exert increasing pressure on the wildland-urban interface (WUI) zone. Based on available data, urban fires and wildfires will continue to present a risk to Passaic County. Given the numerous factors that can impact urban fire and wildfire potential, the likelihood of a fire event starting and sustaining itself should be gauged by professional fire managers on a daily basis.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for wildfire in the county is considered "frequent"; however, events such as brush fires have had no major impacts.

Climate Change

A gradual change in temperatures will alter the growing environment of many tree species throughout the United States and New Jersey, reducing the growth of some trees and increasing the growth of others. Tree growth and regeneration may be affected more by extreme weather events and climatic conditions than by gradual changes in temperature or precipitation. Warmer temperatures may lead to longer dry seasons and multi-year droughts, creating triggers for wildfires, insects, and invasive species. Increased temperature and change in precipitation will also affect fuel moisture during wildfire season and the length of time during while wildfires can burn during a given year (U.S. Department of Agriculture [USDA] 2012). Climate change may also increase the frequency of lightning strikes. A warmer atmosphere holds more moisture which is one of the key items for triggering a lightning strike. Lightning strikes cause approximately half the wildfires in the United States. If the frequency of lightning strikes increases, the potential for wildfires from these strikes also increases (Lee 2014). Wildfire incidents are predicted to increase throughout the United States due to climate change, causing at least a doubling of areas burned within the next century (USDA 2012).

Average annual temperatures have increased by 3°F in New Jersey over the past century (NOAA NCEI 2019). By the 2020s, the average annual temperature in New Jersey is projected to increase by 1.5°F to 3°F above the statewide baseline (1971 to 2000), which was 52.7°F. By 2050, the temperature is projected to increase 3°F to 5°F (Sustainable Jersey Climate Change Adaptation Task Force 2011). As for precipitation, Northern New Jersey's 1971-2000 precipitation average was over five inches (12%) greater than the average from 1895-1970 (Office of New Jersey State Climatologist). Average annual precipitation is projected to increase in the region up to 10% by the 2020s and up to 15% by the 2050s. Most of the additional precipitation is expected to come during the winter months (New York City Panel on Climate Change [NPCC] 2013).

As stated above, according to the temperature projections for northern New Jersey, including Passaic County, this area can expect warmer and drier conditions which may increase the frequency and intensity of wildfires.

Higher temperatures are expected to increase the amount of moisture that evaporates from land and water. These changes have the potential to lead to more frequent and severe droughts, which, in turn, increases the likelihood of wildfires (USEPA 2014; Northern Arizona University 2012).

4.3.13.2 Vulnerability Assessment

A spatial analysis was conducted using the NJFFS Wildfire Fuel Hazard spatial layer**.** For the purposes of the assessment, an asset **(**population, structures, critical facilities, and lifelines) is considered exposed and potentially vulnerable to the wildfire hazard if it is located in the 'extreme', 'very high' and 'high' wildfire fuel hazard areas**.** Refer to Section 4.2 for additional details on the methodology used to assess wildfire risk.

Impact on Life, Health, and Safety

Wildfires have the potential to impact human health and life of residents and responders, structures, infrastructure, and natural resources. The most vulnerable populations include emergency responders and those within a short distance of the interface between the built environment and the wildland environment. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. Table 4.3.13-4 summarizes the estimated population exposed to the wildfire hazard by municipality.

Based on the analysis, an estimated 402 residents, or less than 1-percent of the County's population, are located in the extreme, high, and very high wildfire hazard areas. Overall, the Township of West Milford has the greatest number of individuals located in the "extreme," "very high," and "high" hazard areas (i.e., 246 persons). This is due to the development proximate to the State Parkland located in the northern portion of the County.

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. In Passaic County, there are 86,667 persons in poverty and 69,429 persons over 65 years old. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impacts on their families. The population over age 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating.

Table 4.3.13-4. Estimated Population Located in the Wildfire Fuel Hazard Ranking Zones County

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed	
		Extreme, Very High, and High	Percent (%) of Total
Bloomingdale, Borough of	8,139	7	0.1%
Clifton, City of	86,207	0	0.0%
Haledon, Borough of	8,440	0	0.0%
Hawthorne, Borough of	19,065	0	0.0%
Little Falls, Township of	14,524	0	0.0%
North Haledon, Borough of	8,564	7	0.1%
Passaic, City of	71,057	0	0.0%
Paterson, City of	147,890	16	0.0%
Pompton Lakes, Borough of	11,205	0	0.0%
Prospect Park, Borough of	5,955	0	0.0%
Ringwood, Borough of	12,451	58	0.5%

Municipality	American Community Survey (2013-2017) Population	Estimated Population Exposed	
		Extreme, Very High, and High	Percent (%) of Total
Totowa, Borough of	10,829	19	0.2%
Wanaque, Borough of	11,782	16	0.1%
Wayne, Township of	55,154	35	0.1%
West Milford, Township of	26,759	246	0.9%
Woodland Park, Borough of	12,542	0	0.0%
Passaic County (Total)	**510,562**	**402**	**0.1%**

Source: American Community Survey 2017; NJFFS 2009

Impact on General Building Stock

Buildings located within the NJFFS identified extreme, very high or high fuel hazard areas are exposed and considered vulnerable to the wildfire hazard. Buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete. Table 4.3.13-5 summarizes the estimated building stock inventory located in the hazard area by municipality. Less than 1% ($825 million) of the County's building replacement cost value is located in the extreme/very high/high hazard area. The Township of West Milford has the greatest number of buildings located in the wildfire hazard area (159 structures – 1.5% of its total) and has the greatest replacement cost value located in the hazard area ($430 million – 4.6% of its total).

All State Forest and State Park areas in the northern portion of the County are under the control of the State Forest Fire Warden with suppression capabilities handled by the NJFFS. The NJFFS does conduct brush maintenance to reduce the risks which includes prescribed burns, clearing underbrush, etc. At a local level, municipalities supply water and manpower to assist during a brush fire.

Table 4.3.13-5. Building Stock Located in the Wildfire Fuel Hazard Ranking Zones

Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Extreme, Very High, and High	Percent (%) of Total	RCV - Extreme, Very High, and High	Percent (%) of Total
Bloomingdale, Borough of	2,611	$1,784,142,939	3	0.1%	$2,954,452	0.2%
Clifton, City of	21,859	$21,649,495,205	4	0.0%	$30,902,070	0.1%
Haledon, Borough of	1,809	$1,708,591,489	0	0.0%	$0	0.0%
Hawthorne, Borough of	5,923	$4,588,063,085	0	0.0%	$0	0.0%
Little Falls, Township of	3,412	$4,633,701,650	1	0.0%	$599,082	0.0%
North Haledon, Borough of	2698	$2,317,277,271	3	0.1%	$10,250,896	0.4%
Passaic, City of	6,918	$11,948,345,444	1	0.0%	$3,993,880	0.0%

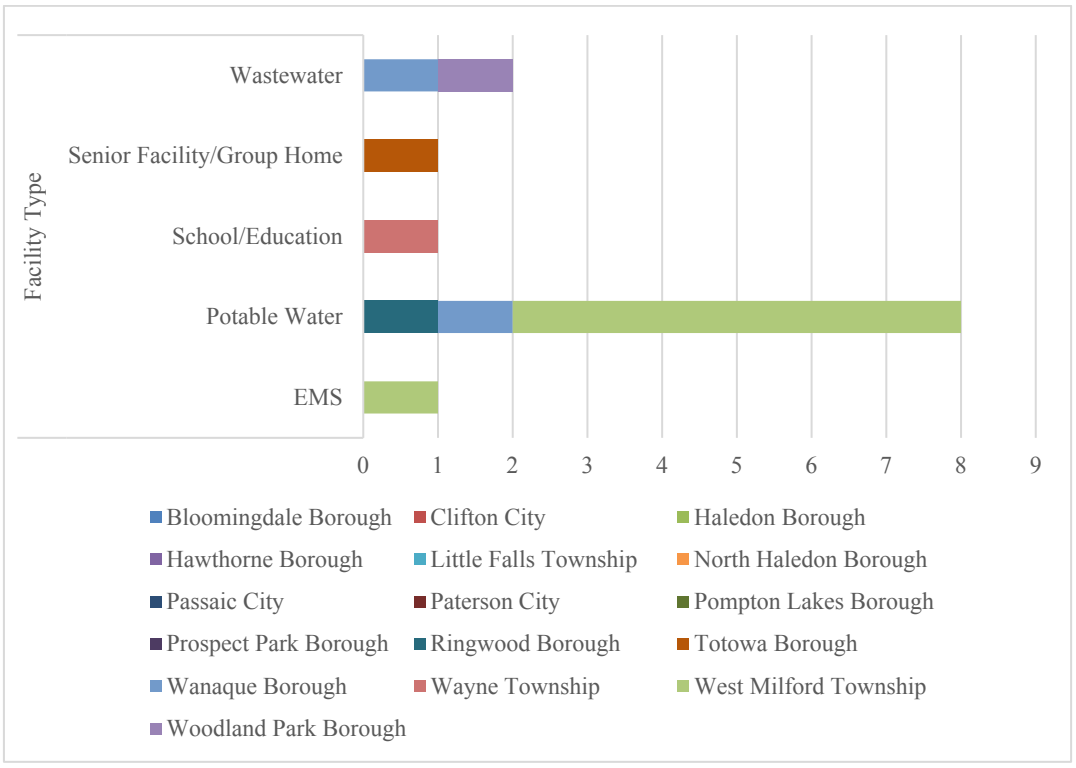
Municipality	Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed			
			Number of Buildings - Extreme, Very High, and High	Percent (%) of Total	RCV - Extreme, Very High, and High	Percent (%) of Total
Paterson, City of	23,609	$55,984,762,201	10	0.0%	$95,981,246	0.2%
Pompton Lakes, Borough of	3,081	$1,853,779,603	3	0.1%	$49,277,082	2.7%
Prospect Park, Borough of	1,101	$709,318,581	0	0.0%	$0	0.0%
Ringwood, Borough of	4,486	$2,724,021,483	27	0.6%	$23,845,193	0.9%
Totowa, Borough of	3,771	$6,476,350,669	6	0.2%	$5,744,514	0.1%
Wanaque, Borough of	3,157	$2,211,149,264	11	0.3%	$9,618,571	0.4%
Wayne, Township of	17,646	$19,125,773,073	20	0.1%	$161,595,675	0.8%
West Milford, Township of	10,794	$9,348,319,367	159	1.5%	$430,046,369	4.6%
Woodland Park, Borough of	3,473	$17,134,672,551	1	0.0%	$948,522	0.0%
Passaic County (Total)	**116,348**	**$164,197,763,874**	**249**	**0.2%**	**$825,757,554**	**0.5%**

Source: NJGIN; Passaic County; NJFFS 2009; Microsoft, 2018, Open Street Map, 2019; NJOIT, 2018

Impact on Critical Facilities

In Passaic County, there are 13 critical facilities located in the wildfire hazard area. Eight out of the 13 critical facilities are potable water facilities (refer to Figure 4.3.13-2). Furthermore, 4 of the critical facilities are considered lifelines for the County. Majority of the critical facilities built within the wildfire hazard area are in the Township of West Milford, consisting of wells, a potable treatment plant, and an emergency management service facility. As mentioned previously, wildfires can have an impact on the water supplies throughout the County because of residual pollutants like char or debris landing in water resources which can clog wastewater pipes, culverts, etc.

Figure 4.3.13-2. Critical Facilities Located in the High, Very High, and Extreme Wildfire Hazard Areas



Source: NJFFS 2009
EMS Emergency Management Services

Impact on the Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed business. These events may cost thousands of taxpayer dollars to suppress and control and may involve hundreds of operating hours on fire apparatus and thousands of volunteer man hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.

Wildfire can also severely impact roads and infrastructure. An exposure analysis found that 18.1% (10.1 miles) of major highways are built within the wildfire hazard area (refer to Table 4.3.13-5). The exposed highways include portions of Interstate 80, Garden State Parkway, U.S. Highways 23 & 46, and NJ State Highway 21. In general, roads and bridges surrounding the areas of fire risk are important because they provide ingress and egress to large areas and, in some cases, to isolated neighborhoods. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers.

Table 4.3.13-5. Number of Miles Major Transportation Routes Built Within Wildfire Hazard Areas

Road Type	Total Miles	Exposure to Wildfires					
		High Hazard Area	Percent (%) of Total	Very High Hazard Area	Percent (%) of Total	Extreme Hazard Area	Percent (%) of Total
Highways	55.5	10.1	18.1%	0.0	0.0%	0.0	0.0%

Source: Passaic County, NJFFS 2009, NJDOT 2016, NJTPA 2019

Due to a lack of data regarding past structural and economic losses specific to Passaic County or its municipalities, it is not possible to estimate future losses due to wildfire events currently.

Impact on the Environment

According to the USGS, post-fire runoff polluted with debris and contaminates can be extremely harmful to ecosystem and aquatic life (USGS 2018). Studies show that urban fires in particular are more harmful to the environment compared to forest fires (USGS 2018). The age and density of infrastructure within Passaic County can exacerbate consequences of fires on the environment because of the increased amount of chemicals and contaminates that would be released from burning infrastructure. These chemicals, such as iron lead, and zinc, may leach into the storm water, contaminate nearby streams, and impair aquatic life.

Future Changes That May Impact Vulnerability

Areas targeted for potential future growth and development in the next five years have been identified across Passaic County at the municipal level. Refer to the jurisdictional annexes in Volume II of this HMP update.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Passaic County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes).

A spatial analysis was conducted to determine the intersection of potential new development identified by municipalities and the wildfire hazard area. The exposure analysis shows that none of these new development locations will be built in wildfire hazard areas; refer to Figure 4.3.13-3.

Projected Changes in Population

Passaic County has experienced population growth since 2010 including the municipalities that are proximate to State Park and State Forest (i.e., the Boroughs of Wanaque and Ringwood, and the Township of West Milford). These communities are also located in the Highlands with restricted development. Fire suppression capabilities are high at the State and local levels. However, new development and changes in population with a mix of additional structures, ornamental vegetation, and wildland fuels will require continued assessment of the hazard and mitigation risk.

Climate Change

According to the U.S. Fire Service (USFS), climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, impact carbon cycling, forest structure, and species composition. Climate change associated with elevated greenhouse gas concentrations may create an atmospheric and fuel environment that is more conductive to large, severe fires (USFS 2011). Under a changing climate, wildfires are expected to increase by 50% across the U.S. (USFS 2013). However, a study from the National Interagency Fire Center of the USGS shows that the number of acres burned by wildfires in New Jersey has decreased by 0.25 acres per square mile from events that took place in 2000 to 2014 compared to events that took place in 1984 and 1999 (USGS 2016).

Understanding the climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include:

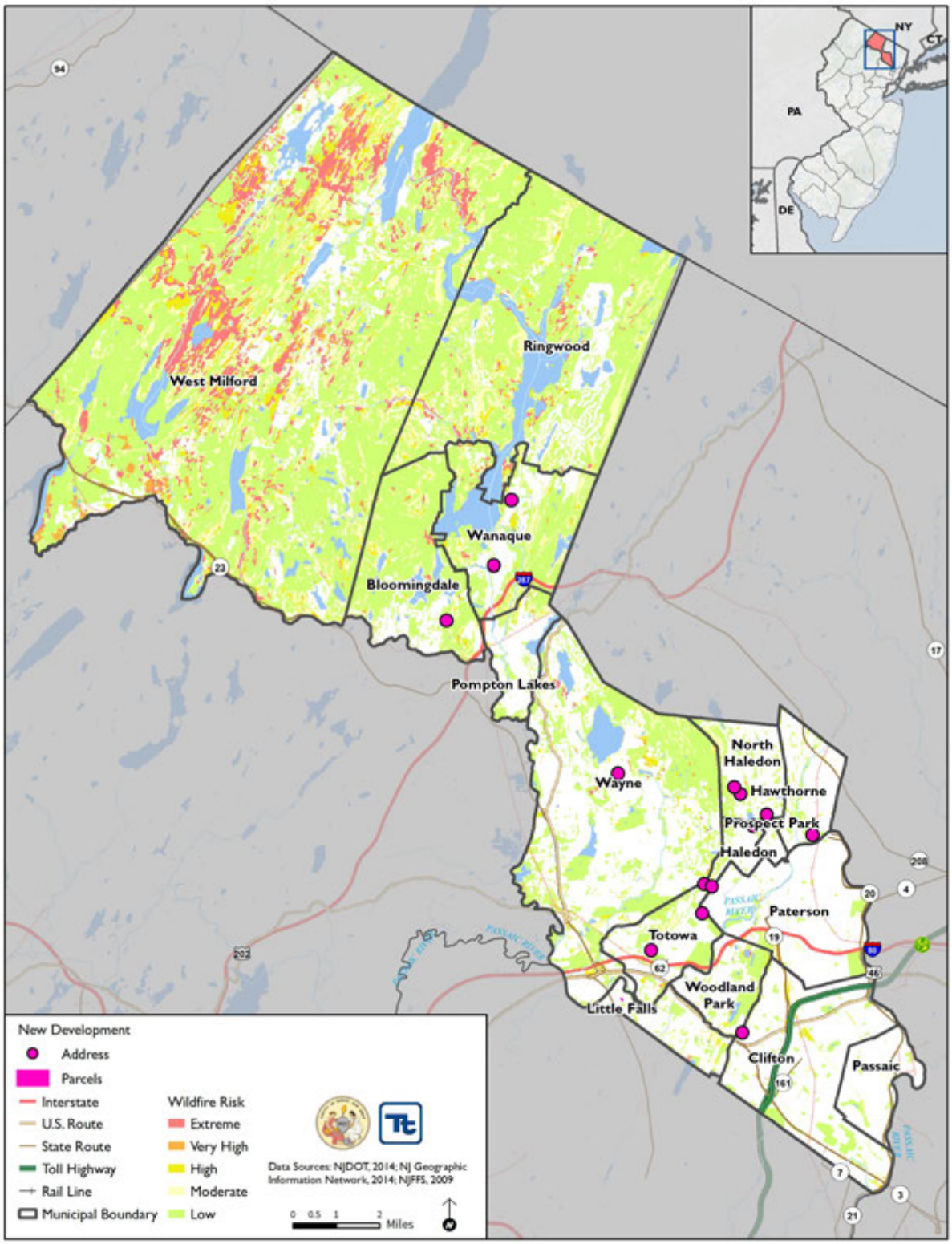
- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition, and
- Complications from land use change, invasive species and an increasing WUI (USFS 2011).

As discussed earlier, average temperatures are anticipated to increase in New Jersey, therefore, suitability of habitats for specific types of trees potentially changes, altering the fire regime and resulting in more frequent fire events and changes in intensity. Prolonged and more frequent heat waves have the potential to increase the likelihood of a wildfire. The increased potential combined with stronger winds may make it harder to contain fires and thus increase the County's vulnerability to this hazard.

Change of Vulnerability Since the 2015 HMP

The 2020 HMP has been updated to reflect 2013-2017 American Community Survey 5-year estimates for population changes. The building stock inventory was updated using Microsoft and Open Street Maps footprints. Further, the building stock inventory replacement cost values were updated using RS Means 2019 values providing an overall update to the assets assessed in this risk assessment. The NJFFS Wildfire Fuel Hazard spatial layer has not been updated since the last HMP; therefore, changes and increased in overall wildfire hazard exposure are attributed to increases in population and new development.

Figure 4.3.13-3. Wildfire Risk and New Development for Passaic County



4.4 HAZARD RANKING

2020 HMP Changes

- The hazard ranking section has been relocated to Section 4.4.
- The 2020 update hazard ranking methodology was expanded to include adaptive capacity and climate change.
- The probability of occurrence category was adjusted to include the benchmark value 'unlikely', and modifications to the remaining categories so that 'frequent' aligned with an event that has an annual probability.
- The following hazards of concern's ranking changed from 2015 to 2020: the earthquake hazard reduced in rank from medium to low; severe weather reduced in rank from high to medium; severe winter weather reduced in rank from high to medium; the wildfire hazard reduced in rank from medium to low.

A comprehensive range of hazards that pose a significant risk to Passaic County were selected and considered during the development of this plan; see Section 4.1 (Identification of Hazards of Concern). However, each community has differing levels of exposure and vulnerability to each of these hazards. It is important for each community participating in this plan to recognize those hazards that pose the greatest risk to their community and direct their attention and resources accordingly to most effectively and efficiently manage risk and reduce losses. The hazard ranking for the county and each participating jurisdiction can be found in their jurisdictional annexes in Volume II, Section 9 of this plan.

To this end, a hazard risk ranking process was conducted for Passaic County and its municipalities using the method described below. This method includes four risk assessment categories—probability of occurrence, impact (population, property and economy), adaptive capacity, and changing future conditions (i.e., climate change). Each was assigned a weighting factor to calculate an overall ranking value for each hazard of concern. Depending on the calculation, each hazard was assigned a high, medium, or low ranking. Details regarding each of these categories is described below.

4.4.1 Hazard Ranking Methodology

Estimates of hazard risk for the County were developed using methodologies promoted by FEMA's hazard mitigation planning guidance, generated by FEMA's HAZUS-MH risk assessment tool, and input from Passaic County and participating jurisdictions.

As described in Section 4.2 (Methodology), three different levels of analysis were used to estimate potential impacts: 1) historic loss/qualitative analysis; 2) exposure analysis; and 3) loss estimation. All three levels of analysis are suitable for planning purposes; however, with any risk analysis, there is underlying uncertainty resulting from assumptions used to describe and assess vulnerability and the methodologies available to model impacts. Impacts from any hazard event within the County will vary from the analysis presented here based on the factors described for each hazard of concern; namely location, extent, warning time, and mitigation measures in place at the time of an event.

The hazard ranking methodology for some hazards of concern is based on a scenario event, while others are based on the potential vulnerability to the County as a whole. In order to account for these differences, the quantitative hazard ranking methodology was adjusted using professional judgement and subject-matter input; assumptions are included, as appropriate, in the following subsections. The limitations of this analysis are recognized given the all scenarios do not have the same likelihood of occurrence; nonetheless, there is value in

summarizing and comparing the hazards using a standardized approach to evaluate relative risk. The following categories were considered when evaluating the relative risk of the hazards of concern.

- **Probability of Occurrence**—The probability of occurrence of the scenario evaluated was estimated by examining the historic record and/or calculating the likelihood of annual occurrence. When no scenario was assessed, an examination of the historic record and judgement was used to estimate the probability of occurrence of an event that will impact the County.
- **Impact**—The following three hazard impact subcategories were considered: impact to people; impact to assets and the economy; and impact to environmental resources and cultural assets. The results of the updated risk assessment and/or professional judgement were used to assign the numeric values for these three impact subcategories. A factor was applied to each subcategory, giving impact on population the greatest weight.
    - Population—Numeric value x 3
    - Buildings—Numeric value x 2
    - Economy—Numeric value x 1
- **Adaptive Capacity**—Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event. This includes capabilities and capacity in the following areas: administrative, technical, planning/regulatory and financial. Mitigation measures already in place increases a jurisdiction's capacity to withstand and rebound from events (e.g. codes/ordinances with higher standards to withstand hazards due to design or location; deployable resources; or plans and procedures in place to respond to an event). In other words, assigning 'low' for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which increases vulnerability; whereas 'high' adaptive capacity means the jurisdiction does have the capability to effectively respond, which decreases vulnerability.

  These ratings were assigned using the results of the core capability assessment with subject-matter input from each jurisdiction.
- **Climate Change (Changing Future Conditions) -** Current climate change projections were considered as part of the hazard ranking to ensure the potential for an increase in severity/frequency of the hazard was included. This was important to Passaic County to include because the hazard ranking helps guide and prioritize the mitigation strategy development, which should have a long-term future vision to mitigate the hazards of concern. The potential impacts climate change may have on each hazard of concern is discussed in Sections 4.4.1 through 4.13. The benchmark values in the methodology are similar to confidence levels outlined in the National Climate Assessment 2017.

Hazard Ranking Equation

[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Table 4.4-1summarizes the categories, benchmark values, and weights used to calculate the risk factor for each hazard. Using the weighting applied, the highest possible risk factor value is 9.0. The higher the number, the greater the relative risk. Based on the total for each hazard, a priority ranking is assigned to each hazard of concern (high, medium, or low). The rankings were categorized as follows: Low = Values less than or equal to 3.8; Medium = Values between 3.9 and 4.9; High = Values greater than or equal to 5.0.

Table 4.4-1. Summary of Hazard Ranking Approach

Category		Level / Category	Degree of Risk / Benchmark Value	Numeric Value	Weighted Value
Probability of Occurrence		Unlikely	A hazard event is not likely to occur or is unlikely to occur with less than a 1% annual chance probability.	0	40%
		Rare	Between 1 and 10% annual probability of a hazard event occurring.	1	
		Occasional	Between 10 and 100% annual probability of a hazard event occurring.	2	
		Frequent	100% annual probability; a hazard event may occur multiple times per year.	3	
Impact (Sum of all 3)	Population (Numeric Value x 3)	Low	14% or less of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.	1	40%
		Medium	15% to 29% of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.	2	
		High	30% or more of your population is exposed to a hazard with potential for measurable life safety impact, due to its extent and location.	3	
	Property (Numeric Value x 2)	Low	Property exposure is 14% or less of the total number of structures for your community.	1	
		Medium	Property exposure is 15% to 29% of the total number of structures for your community.	2	
		High	Property exposure is 30% or more of the total number of structures for your community.	3	
	Economy (Numeric Value x 1)	Low	Loss estimate is 9% or less of the total replacement cost for your community.	1	
		Medium	Loss estimate is 10% to 19% of the total replacement cost for your community.	2	
		High	Loss estimate is 20% or more of the total replacement cost for your community.	3	
Adaptive Capacity		Low	Weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.	3	10%
		Medium	Plans, policies, codes/ordinances in place and meet minimum requirements; mitigation strategies identified but not implemented on a widespread scale; county/jurisdiction can recover but needs outside resources; moderate county/Jurisdiction capabilities.	2	
		High	Plans, policies, codes/ordinances in place and exceed minimum requirements; mitigation/protective measures in place; county/jurisdiction has ability to recover quickly because resources are readily available, and capabilities are high.	1	
Climate Change		Low	No local data is available; modeling projections are uncertain on whether there is increased future risk; confidence level is low (inconclusive evidence).	1	10%
		Medium	Studies and modeling projections indicate a potential for exacerbated conditions due to climate change; confidence level is medium to high (suggestive to moderate evidence).	2	
		High	Studies and modeling projections indicate exacerbated conditions/increased future risk due to climate change; very high confidence level (strong evidence, well documented and acceptable methods).	3	

Note: A numerical value of zero is assigned if there is no impact.

**For the purposes of this exercise, "impacted" means exposed for population and property and estimated loss for economy. For non-natural hazards, although they may occur anywhere in the County, an event will not likely cause countywide impacts; therefore, impact to population was scored using an event-specific scenario.*

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 4.4-2 summarizes the hazard scenario or hazard area evaluated; highlights key impacts to population, buildings/critical assets and the economy; and lists the associated certainty factor assigned for each hazard to convey the level of confidence in the data used. This table is not intended to be a complete and comprehensive list of all hazard impacts determined in the risk assessment and considered for the hazard ranking exercise. Refer to Sections 4.3.1 to 4.3.13 for a complete summary of all estimated impacts for each hazard.

Table 4.4-2. Overview of the Hazard Scenario and Associated Estimated Impacts Considered in the Hazard Ranking

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Event (Tropical Storm Wind Speeds)	100-Year Mean Return Period Event	510,562	100-year MRP Event Building Loss (Wind Impacts Only):	116,348	100-year MRP Event Building Loss (Wind Impacts Only):	$38,315,058	High
Dam Failure	Partial or complete failure of a dam. There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	NEHRP D&E:	73,422	NEHRP D&E:	17,159	100-year MRP building damages/loss:	$51,322	High
		Liquefaction Class 4:	8,867	Liquefaction Class 4:	2,311	500-year MRP building damages/loss:	$3,207,053	
						2,500-year MRP building damages/loss:	$45,406,197	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	69,429	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators and HVAC; thermal expansion and other impacts to infrastructure.		Low
		Population Below Poverty Level:	86,796					

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance (100-year)	17,849	1% annual chance (100-year)	5,435	1% annual chance (100-year)	$469,494,456	High
		0.2% annual chance (500-year)	29,702	0.2% annual chance (500-year)	13,481			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	882	Class A:	317	Class A:	$222,609,140	Moderate
		Class B:	457	Class B:	140	Class B:	$88,643,806	
		Carbonate Bedrock:	10,175	Carbonate Bedrock:	4117	Carbonate Bedrock:	$3,063,309,095	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation and Invasive Species including insects and harmful algal bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	402	Number of buildings the hazard area:	249	Replacement cost value of buildings located in the hazard area:	$825,757,554	Moderate

Notes:
a Estimated loss in replacement cost values as available from HAZUS-MH.
b The impacts and vulnerability from a hazardous materials event are greatly dependent on the material and its physical and chemical properties, the quantity released, weather conditions, micro-meteorological effects of buildings and terrain, maintenance/mechanical failures, and distance and related response time for emergency response teams.
** HAZUS-MH estimated potential losses based on probabilistic models*
Exposed = This refers to the number of assets located in the hazard area; all of which may not incur losses as a result of the event.
SFHA = Special flood hazard area (1-percent annual chance flood event)
RCV = Replacement cost value based on 2019 RSMeans

Table 4.4-3 summarizes the projected changes in hazard event occurrences in terms of location, extent or intensity and frequency and/or duration. In addition, it lists the associated value assigned to each hazard in the risk factor calculation (i.e., confidence in changing future conditions). Refer to Sections 4.2 to 4.13 for a more detailed discussion of all factors of change discussed for each hazard of concern.

Table 4.4-3. Overview of Projected Future Changes for each Hazard of Concern

Hazard	Projected Change			Confidence in Changing Future Conditions [a]
	Location	Extent/ Intensity	Frequency/ Duration	
Coastal Storm	↑	↑	↑	Highly Likely
Dam Failure	↑	↑	↑	Likely
Disease Outbreak	—	—	↑	Likely
Drought		↑	↑	Likely
Earthquake	—	—	—	Uncertain
Extreme Temperature	↑	↑	↑	Highly Likely
Flood	↑	↑	↑	Highly Likely
Geological Hazards	—	—	—	Uncertain
Hazardous Substances	—	—	—	Likely
Infestation and Invasive Species	↑	↑	↑	Likely
Severe Weather	↑	↑	↑	Highly Likely
Severe Winter Weather	—	↓	↓	Likely
Wildfire	↑	↑	↑	Likely

Notes:
Arrow direction indicates a projected increase or decrease based on literature review as described in Sections 4.3.1 through 4.3.13
— *Straight line indicates uncertain and/or no change known at this time.*

a Similar to confidence levels outlined in the National Climate Assessment 2017

Highly Likely = Studies and modeling projections indicate exacerbated conditions/increased future risk due to climate change; very high confidence level (strong evidence, well documented and acceptable methods).
Likely = Studies and modeling projections indicate a potential for exacerbated conditions due to climate change; confidence level is medium to high (suggestive to moderate evidence).
Uncertain = No local data is available; modeling projects are uncertain on whether there is increased future risk; confidence level is low (inconclusive evidence).
No Change = Studies and modeling projections indicate there is no evidence at this time to indicate conditions may change in the future.

4.4.2 Hazard Ranking Results

Using the process described above, the risk ranking for the identified hazards of concern was determined for Passaic County (refer to Table 4.4-4). The hazard ranking is detailed in the subsequent tables that present the step-wise process for the ranking. The countywide risk ranking includes the entire planning area and may not reflect the highest risk indicated for any of the participating jurisdictions. The resulting ranks of each municipality indicate the differing degrees of risk exposure and vulnerability. The results support the appropriate selection and prioritization of initiatives to reduce the highest levels of risk for each municipality. Both the county and the participating jurisdictions have applied the same methodology to develop the countywide risk and local rankings to ensure consistency in the overall ranking of risk; jurisdictions had the ability to alter rankings based on local knowledge and experience in handling each hazard.

This hazard ranking exercise serves four purposes: 1) to describe the probability of occurrence for each hazard; 2) to describe the impact each would have on the people, property, and economy; 3) to evaluate the capabilities a community has with regards to the hazards of concern; and 4) to consider changing future conditions (i.e., climate change) in Passaic County.

Table 4.4-4. Ranking for Hazards of Concern for Passaic County

Hazard of Concern	Probability		Impact									Total Impact Value)	Adaptive Capacity	Climate Change
			Population			Property			Economy					
	Category	Numeric Value	Impact	Numeric Value	Weighted Value (x3)	Impact	Numeric Value	Weighted Value (x2)	Impact	Numeric Value	Weighted Value (x1)			
Coastal Storm	Frequent	3	H	3	9	H	3	6	L	1	1 x 1 = 1	16	2	2
Dam Failure	Rare	1	M	2	6	L	1	2	L	1	1 x 1 = 1	9	2	2
Disease Outbreak	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	2
Drought	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	2
Earthquake	Rare	1	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	1
Extreme Temperature	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	3
Flood	Frequent	3	M	2	6	L	1	2	L	1	1 x 1 = 1	9	2	3
Geological Hazards	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	1
Hazardous Substances	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	2
Infestation and Invasive Species	Frequent	3	L	1	3	M	2	8	L	1	1 x 1 = 1	6	2	2
Severe Storm	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	3
Severe Winter Weather	Frequent	3	L	1	3	L	1	2	L	1	1 x 1 = 1	6	1	2
Wildfire	Occasional	2	L	1	3	L	1	2	L	1	1 x 1 = 1	6	2	2

**Historical record is not long to support this evaluation and input is based on Steering Committee judgement*

H = High; L = Low; M = Medium

Table 4.4-5 presents the total calculations for each hazard ranking value for the hazards of concern.

Table 4.4-5. Total Hazard Ranking Values for the Hazards of Concern for Passaic County

Hazard of Concern	Probability x 40%	Total Impact x 40%	Adaptive Capacity x 10%	Changing Future Conditions x 10%	Total Hazard Ranking Value
Coastal Storm	1.2	6.4	0.2	0.2	**8.0**
Dam Failure	0.4	3.6	0.2	0.2	**4.4**
Disease Outbreak	1.2	2.4	0.2	0.2	**4.0**
Drought	1.2	2.4	0.2	0.2	**4.0**
Earthquake	0.8	2.4	0.2	0.1	**3.1**
Extreme Temperature	1.2	2.4	0.2	0.3	**4.1**
Flood	1.2	3.6	0.2	0.3	**5.3**
Geological Hazards	1.2	2.4	0.2	0.1	**3.9**
Hazardous Substances	1.2	2.4	0.2	0.2	**4.0**
Infestation and Invasive Species	1.2	3.2	0.2	0.2	**4.8**
Severe Storm	1.2	2.4	0.2	0.3	**4.1**
Severe Winter Weather	1.2	2.4	0.1	0.2	**3.9**
Wildfire	0.8	2.4	0.2	0.2	**3.6**

Low = Values less than or equal to 3.8; Medium = Values between 3.9 and 4.9; High = Values greater than or equal 5.0.

These rankings have been used as one of the bases for identifying the jurisdictional hazard mitigation strategies included in Section 9 (Jurisdictional Annexes) of this plan. The summary rankings for the County reflect the results of the vulnerability analysis for each hazard of concern and vary from the specific results of each jurisdiction. For example, the severe storm hazard may be ranked low in one jurisdiction, but due to the exposure and impact countywide, it is ranked as a high hazard and is addressed in the County's mitigation strategy accordingly. Jurisdictional ranking results are presented in each local annex in Section 9 (Jurisdictional Annexes) of this plan.

SECTION 5. CAPABILITY ASSESSMENT

2020 HMP Changes

- In the 2015 HMP, the capability assessment section was presented in Section 6 as part of the mitigation strategy. For the 2020 HMP update, the capability assessment was expanded and presented in Section 5 as a stand-alone section with capabilities expanded in each jurisdictional annex as well (Section 9 [Jurisdictional Annexes]).

According to FEMA's *Mitigation Planning How-To Guide #3*, a capability assessment is an inventory of a community's missions, programs, and policies and an analysis of its capacity to carry them out. Each jurisdiction has a unique set of capabilities available to accomplish mitigation and reduce long-term vulnerable to future hazard events. Capabilities include authorities, policies, programs, staff, and funding. Reviewing existing capabilities helps identify capabilities that currently implement mitigation and leads to loss reductions or that have the potential to be implemented in the future.

This assessment is an integral part of the planning process. The assessment process enables identification, review, and analysis of current federal, state, and local programs, policies, regulations, funding, and practices that could either facilitate or hinder mitigation.

During the original planning process, Passaic County and participating jurisdictions identified and assessed their capabilities in the areas of existing programs, policies, and technical documents. By completing this assessment, each jurisdiction learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Limitations that could exist on undertaking actions.
- The range of local and state administrative, programmatic, regulatory, financial, and technical resources available to assist in implementing their mitigation actions.
- Actions deemed infeasible, as they are currently outside the scope of capabilities.
- Types of mitigation actions that could be technically, legally (regulatory), administratively, politically, or fiscally challenging or infeasible.
- Opportunities to enhance local capabilities to support long term mitigation and risk reduction.

During the plan update process, all participating jurisdictions were tasked with developing or updating their capability assessment, paying particular attention to evaluating the effectiveness of these capabilities in supporting hazard mitigation and identifying opportunities to enhance local capabilities to integrate hazard mitigation into their plans, programs, and day-to-day operations.

County and municipal capabilities in the Planning and Regulatory, Administrative and Technical, and Fiscal subjects can be found in the Capability Assessment section of each jurisdictional annex in Section 9 (Jurisdictional Annexes).

5.1 UPDATE PROCESS SUMMARY

The purpose of the capability assessment is to understand the planning, regulatory, administrative, technical, and financial capabilities present in Passaic County. This assessment helps the County and its jurisdictions identify strengths and opportunities that can be used to reduce losses from hazard events and reduce risks throughout Passaic County.

To complete the capability assessment, the contracted consultant met with Passaic County and each municipality one-on-one to review the capability assessment from the 2015 HMP and update accordingly. In addition to in-person meetings, the consultant reviewed plans and codes/ordinances to enhance the information provided by the jurisdictions.

A summary of the various federal and state capabilities available to promote and support mitigation and reduce risk in Passaic County are presented below. Information provided by the County and municipalities are presented in Volume II, Section 9 (Jurisdictional Annexes) of this plan update.

5.2 PLANNING AND REGULATORY CAPABILITY

Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws and state statutes, and plans and programs that relate to guiding and management growth and development. Planning and regulatory capabilities refer not only to the current plans and regulations, but also to the jurisdiction's ability to change and improve those plans and regulations as needed. The following provides the planning and regulatory capabilities for Passaic County.

5.2.1 Planning and Regulatory Capabilities – Federal and State

Table 5-1. Planning and Regulatory Capabilities – Federal and State

Capability	Details	
Disaster Mitigation Act (DMA)	**Description:**	The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Assistance grant funds are available to communities. This plan is designed to meet the requirements of DMA, improving eligibility for future hazard mitigation funds.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	HMPs designed to meet the requirements of DMA will remain eligible for future FEMA Hazard Mitigation Assistance funds
	Hazard:	All-natural hazards
National Flood Insurance Program (NFIP)	**Description:**	The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. The Flood Hazard Profile in Section 4.3.6 (Flood) provides information on recent legislation related to reforms to the NFIP. All municipalities in Passaic County participate in the NFIP.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Full compliance and good standing under the NFIP are application prerequisites for all FEMA grant programs for which participating jurisdictions are eligible under this plan.
	Hazard:	Flood
NFIP Community Rating System (CRS)	**Description:**	As an additional component of the NFIP, CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses, (2) facilitate accurate insurance rating, and (3) promote the awareness of flood insurance. Municipalities, and the county as a whole, could expect significant cost savings on premiums if enrolled in the CRS program. The following communities in Passaic County participate in the CRS program. • Borough of Bloomingdale – Class 8 • Township of Little Falls – Class 6

Capability	Details	
		• Borough of Pompton Lakes – Class 5 • Township of Wayne – Class 7 • Borough of Woodland Park – Class 8
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	CRS premium discounts on flood insurance range from 5 percent for Class 9 communities up to 45 percent for Class 1 communities.
	Hazard:	Flood
Municipal Land Use Law	**Description:**	The State of New Jersey Municipal Land Use Law (L.1975, c. 291, s. 1, effective August 1, 1976) is the legislative foundation for the land use process in the State of New Jersey, including decisions by Planning Boards and Zoning Boards of Adjustment. It defines the powers and responsibilities of boards and is essential to their functions and decisions. It also provides the required components of a municipal master plan. Every municipal agency must adopt and can amend reasonable rules and regulations, consistent with this act or with any applicable ordinance, for the administration of its functions, powers, and duties. These plans help jurisdictions review their land use plans and policies with public participation. The Municipal Land Use Law requires that each municipality prepare a comprehensive plan and update that plan every 10 years.
	Responsible Agency:	State of New Jersey
	Provides Funding for Mitigation:	No
	Hazard:	All
State of New Jersey Hazard Mitigation Plan (2019 Update)	**Description:**	The State of New Jersey HMP includes an evaluation of the state's overall pre- and post-hazard mitigation policies, programs, and capabilities; the policies related to development in hazard-prone areas; and the state's funding capabilities. The State of New Jersey HMP thoroughly describes the federal and state programs available to Passaic County to promote mitigation. The State of New Jersey HMP was used as a resource in developing Passaic County's HMP update.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Critical Area Protection Policy	**Description:**	The following NJDEP programs both protect critical natural resources, and provide funding for the State, municipalities, and counties to purchase land for open-space preservation and recreation, which may directly or indirectly support hazard mitigation efforts: • Green Acres Program • Blue Acres Program • Historical Preservation Program • Farmland Preservation • Wetlands Act of 1970 (N.J.S.A. 13:9A) • Soil and Erosion and Sediment Control Act (N.J.S.A. 4:24) The Wetlands Act of 1970 (N.J.S.A. 13:9A) provide rules and regulations governing development in wetland areas of New Jersey. New Jersey has 15 soil conservation districts, following county boundaries that implement the New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24), which governs certain aspects of new development. On December 22, 1992, the Passaic County Board of Chosen Freeholders established the Passaic County Open Space & Farmland Preservation Trust Fund with the voter approval of the 1992 referendum. Collection of funds for the Trust Fund commenced on July 1, 1993 with a tax equal to ½ cent per $100 of total county equalized real property valuation. The Preservation Trust Fund Programs include: County Park Improvement Program, Historic Preservation, Agricultural Development Board, Open

Capability	Details	
		Space Preservation including the Flood Mitigation Program, and Trail Construction Grant Program. The levy for 2020 is ¾ cent per $100 valuation and, as approved by Freeholder Resolutions #61 and #62, adopted January 22, 2020.
	Responsible Agency:	NJDEP, Passaic County Preservation Trust
	Provides Funding for Mitigation:	Yes – the various programs (Green Acres, Blue Acres) provide funding to jurisdictions to acquire land and properties and turn into open space. The Passaic County Preservation Trust can be used to acquire floodprone residential properties.
	Hazard:	Flood, Severe Weather
Uniform Construction Code (UCC)	**Description:**	Building codes mandate best practices and technology, much of which is designed to reduce or prevent damage from occurring when structures are under stress. The UCC adopts up-to-date building codes as its Building Subcode and One- and Two-Family Subcode. These Subcodes contain requirements that address construction in both A and V flood zones. Also, all new construction is required to comply with the UCC for flood zone construction. New Jersey has enacted legislation directing the Department of Community Affairs (NJ DCA) to adopt a radon hazard code or revise the state building code to establish "adequate and appropriate standards to ensure that schools and residential buildings within tier one areas [as defined by the state] ... are constructed in a manner that minimizes radon gas and radon progeny entry and facilitates any subsequent remediation that might prove necessary." See N.J. Stat. Ann. 52:27D-123a. The Department then adopted a radon hazard sub-code which does not reference existing model standards or guidance, but which sets forth the basic requirements for a passive sub-slab or sub-membrane depressurization system. See N.J. Admin. Code 5:23-10.4. The radon control standards and procedures apply to new residential construction (and school construction) in "tier one" areas, as defined by the state, and Appendix 10-A of the sub-code lists the specific municipalities that are designated as tier one areas.
	Responsible Agency:	NJ DCA
	Provides Funding for Mitigation:	No
	Hazard:	All
Floodplain Management Policy	**Description:**	New Jersey State Law Flood Hazard Area Control Act (NJSA 58:16A-52): The Act and regulations attempts to minimize damage to life and property from flooding caused by development within fluvial and tidal flood hazard areas, to preserve the quality of surface waters, and to protect the wildlife and vegetation that exist within and depend upon such areas for sustenance and habitat. While it does not require local adoption, as it is enforced by the NJDEP, the floodplain ordinances of each municipality need to be reviewed to be in compliance with this new regulation.
	Responsible Agency:	New Jersey Department of Environmental Protection (NJDEP)
	Provides Funding for Mitigation:	No
	Hazard:	Flood
Growth Management Policy	**Description:**	Land preservation and recreation comprise one of the cornerstones of New Jersey's smart growth policy. The New Jersey Statewide Comprehensive Outdoor Recreation Plan provides Statewide policy direction to the State, local governments, and conservation organizations in the preservation of open space and the provision of public recreation opportunities. The State Plan was prepared and adopted by the State Planning Commission according to the requirements of the State Planning Act of 1985 as amended (NJSA 52:18A-196 et seq.) to serve as an instrument of State

Capability	Details	
		policy to guide State agencies and local government in the exercise of governmental powers regarding planning, infrastructure investment and other public actions and initiatives that affect and support economic growth and development in the State. Green Acres Program, Open Space Tax Program, and Development and Redevelopment Plan. The State Planning Act has enhanced the traditionally limited role of county land-use planning and control. Also provides tools for municipalities when preparing their master land use plans and better opportunity for a comprehensive approach to planning so not to harm or be in conflict with neighboring Municipalities' plans.
	Responsible Agency:	
	Provides Funding for Mitigation:	No
	Hazard:	All

5.2.2 Planning and Regulatory Capabilities – County and Local

Detailed information regarding these capabilities can be found in each jurisdictional annex found in Volume II, Section 9 (Jurisdictional Annexes).

5.3 ADMINISTRATIVE AND TECHNICAL CAPABILITY

Administrative and technical capabilities refer to the jurisdiction's staff and their skills and tools that can be used for mitigation planning and implementation. It also refers to the ability to access and coordinate the resources effectively. The following provides the administrative and technical capabilities for Passaic County.

5.3.1 Administrative and Technical Capability – Federal and State

Table 5-2. Administrative and Technical Capability – Federal and State

Capability		
Recovery Bureau	**Description:**	The Chief of the Recovery Bureau supervises the Mitigation, Public Assistance, and Finance Units. The Mitigation Unit undertakes hazard mitigation planning and the review of mitigation projects in advance of potential disasters and is also activated during and immediately after disasters to evaluate existing and proposed mitigation measures in the affected areas.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Mitigation Unit	**Description:**	The Mitigation Unit, within the Emergency Management Section, has the mission of enhancing state, county, and municipal risk reduction through the development and implementation of mitigation strategies. Hazard mitigation, by definition, is any sustained action that prevents or reduces the loss of property or human life from recurring hazards. The Mitigation Unit accomplishes this task by implementing and administering several grant-based programs in conjunction with FEMA.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Preparedness Bureau	**Description:**	The Preparedness Unit in the Preparedness Bureau is responsible for disseminating preparedness information in advance of a disaster or potential disaster. The Preparedness Unit maintains an extensive library of natural disaster preparedness and recovery information on its Plan and Prepare website (http://ready.nj.gov/plan-prepare/index.shtml). The

Capability		
		disaster preparedness and recovery information featured prominently on the New Jersey State Police and NJOEM website home pages (http://njsp.org/ and http://ready.nj.gov/index.shtml) is a critical part of New Jersey's efforts to protect public health and safety and to minimize loss of life and property in the event of a disaster.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Hazard Mitigation Grant Program Administrative Plan	**Description:**	In the event that an active disaster declaration has necessitated a FEMA-approved Hazard Mitigation Grant Program (HMGP) Administrative Plan, the plan is reviewed to ensure compliance with the prevailing guidance and to set forth the administrative procedures, organization, and requirements for administering the HMGP in New Jersey. The HMGP Administrative Plan is developed by the state and details the process for prioritizing post-disaster mitigation funding of local mitigation projects.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Bureau of Dam Safety & Flood Control	**Description:**	The Bureau of Dam Safety & Flood Control leads the state's efforts filling the State NFIP Coordinator position and providing Community Rating System (CRS) support. In addition, the section's responsibilities include the funding of construction and operation of federal, state, and local flood control mitigation projects throughout the state. The section has also taken a lead role on the development and adoption of NJ Flood Hazard Area mapping, as well as an active partnership with FEMA on their Map Modernization Program efforts. The bureau assists communities participating in the NFIP and interested in joining CRS through the NJDEP Community Assistance Program Unit.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
Dam Safety Section	**Description:**	The NJDEP Dam Safety Section under the Bureau of Dam Safety & Flood Control has responsibility for overseeing dam safety in the state. The primary goal of the program is to ensure the safety and integrity of dams in New Jersey, and thereby protect people and property from the consequences of dam failures. The section also coordinates with the Division of State Police, local and county emergency management officials in the preparations and approval of emergency action plans. The Dam Safety Section reviews plans and specifications for the construction of new dams or for the alteration, repair, or removal of existing dams. The section must grant approval before the owner can proceed with construction. Engineers from the Dam Safety Section evaluate each project, investigate site conditions, and check recommended construction materials. During construction, engineers identify conditions that may require design changes, check for compliance with approved plans and specifications, and approve foundations before material is placed. Existing dams are periodically inspected to assure that they are adequately maintained, and owners are directed to correct any deficiencies found. The regulations require the owner to obtain a professional engineer to inspect their dams on a regular basis. These investigations include a comprehensive review of all pertinent material contained in the Section's files, a visual inspection, technical studies when necessary, and preparation of a comprehensive report.
	Responsible Agency:	NJDEP

Capability		
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
Division of Water Supply and Geoscience	**Description:**	This Division works to ensure adequate, reliable, and safe water supply is available for the future. This goal is accomplished through the regulation of ground and surface water diversions, permitting of wells, permitting of drinking water infrastructure, monitoring of drinking water quality, and technical support for water systems to achieve compliance with all federal and state standards. Water Supply staff provides technical assistance to assist water systems during water supply emergencies, as needed to re-establish safe and adequate public water supplies, and to address routine non-compliance from significant deficiencies or poor water quality test results. The Drinking Water State Revolving Fund (DWSRF) program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Environmental Infrastructure Trust (NJEIT) funds. Additionally, Water Supply provides operator licensing and training support as well as financial assistance through the DWSRF program.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	All
New Jersey Geological and Water Survey	**Description:**	The New Jersey Geological and Water Survey evaluates geologic, hydrogeologic and water quality data to manage and protect water resources, to identify natural hazards and contaminants, and to provide mineral resources including offshore sands for beach nourishment. Information provided by the survey includes GIS data and maps of geology, topography, groundwater, and aquifer recharge. In addition, the data tracks wellhead protection areas, aquifer thicknesses, properties and depths, groundwater quality, drought, geologic resources, and hazards such as earthquakes, abandoned mines, karst-influenced sinkholes, and landslides.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	No
	Hazard:	Drought, Earthquake, Geological
Office of Planning Advocacy	**Description:**	The New Jersey Office of Planning Advocacy (OPA) supports and coordinates planning throughout the state to protect the environment, mitigate development hazards and guide future growth into compact, mixed use development and redevelopment while fostering a robust long-term economy. The OPA implements the goals of the State Development and Redevelopment Plan to achieve comprehensive, long-term planning; and integrates that planning with programmatic and regulatory land use decisions at all levels of government and the private sector.
	Responsible Agency:	New Jersey Department of the State
	Provides Funding for Mitigation:	No
	Hazard:	Natural Hazards
Office of the State Climatologist	**Description:**	The Office of the New Jersey's State Climatologist (ONJSC) generates and archives climate data. Generated data are from the New Jersey Weather and Climate Network (NJWxNet), which is an assemblage of 55 automated weather stations situated throughout the state. A decade or more of hourly observations are available from some of the stations, while others have shorter records. Since fall 2012 observations are available on a five-minute basis. Along with these records, ONJSC archives or has ready access to National Weather Service Cooperative Weather Station data. These are daily observations from several dozen stations at any given time over the past

Capability		
		century. Individual stations have as many as 120 years of data while other stations have started or ceased operating since the late 1800s. Another source of generated data is the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS), which includes daily observations of rain and snow from as many as several hundred volunteers throughout the state.
	Responsible Agency:	Rutgers University
	Provides Funding for Mitigation:	No
	Hazard:	Natural Hazards
New Jersey Climate Adaptation Alliance (NJADAPT)	**Description:**	NJADAPT focuses on climate change preparedness for New Jersey in key impact sectors (public health; watersheds, rivers and coastal communities; built infrastructure; agriculture; and natural resources). NJADAPT is a collaborative effort of scientists and data managers in academia, government, the private sector and non-governmental organization community who have developed a strategic plan for a New Jersey platform to host and apply climate science impacts and data. The NJADAPT website (http://www.njadapt.org/) includes a flood exposure profile for community discussions about hazard impacts; NJ Flood Mapper (which is a tool for flooding hazards and sea level rise); and Getting to Resilience (a tool used to help communities reduce vulnerability and increase preparedness).
	Responsible Agency:	Rutgers University
	Provides Funding for Mitigation:	No
	Hazard:	Flood, Severe Weather
New Jersey Highlands Council	**Description:**	The Highlands Water Protection and Planning Council (Highlands Council) is a regional planning agency that works in partnership with municipalities and counties in the Highlands Region to encourage a comprehensive regional approach to implementing the 2004 Highlands Water Protection and Planning Act (the Highlands Act). The Highlands Act established the Highlands Council and charged it with the creation and adoption of a regional master plan to protect and enhance the natural resources within the New Jersey Highlands. The Highlands Regional Master Plan (RMP) was adopted by the Highlands Council on July 17, 2008 and became effective on September 8, 2008. Conformance with the Highlands RMP is a two-phase process: petition and implementation. During the petition process, municipalities and counties work in collaboration with Highlands Council staff to prepare draft documents that will integrate the land use and resource management requirements of the Highlands Act into local regulatory and planning documents. Once a petition is approved by the Highlands Council, work begins on implementation, which involves finalizing those documents for local adoption and ongoing management of resources. Passaic County is located in the Highlands Region. The Highlands Council may provide grant funding to municipalities and counties to support local hazard mitigation planning. Such plans would identify local level risks associated with extreme storm events and develop local actions that would potentially prevent or mitigate hazardous situations. For example, grants fund stormwater management plans which support green infrastructure for stormwater management, as well as stormwater mitigation plans. These plans should be in place prior to disaster events. Highlands Council grants may be used for planning, design, and/or engineering activities, but do not fund capital expenses. The Highlands Council is participating in the Governor's Climate Resiliency initiative and is preparing to develop a Highlands Climate Change chapter of the Regional Master Plan.

Capability		
		The Highlands Council has initiated a stormwater management program for counties and municipalities to assist in advance planning. The Council also requires extensive green stormwater infrastructure for all projects reviewed. The Highlands was a member of the Advisory Committee when Passaic County developed their Green Stormwater Infrastructure Element.
	Responsible Agency:	New Jersey Highlands Council
	Provides Funding for Mitigation:	Yes
	Hazard:	All
North Jersey Transportation Planning Authority (NJTPA)	**Description:**	The NJTPA is the federally authorized Metropolitan Planning Organization for the 13-county northern New Jersey region. Each year, they oversee over $2 billion in transportation improvement projects and provide a forum for interagency cooperation and public input. The Passaic River Basin Climate Resilience Planning Study was completed in 2019. The study focuses on the potential impacts that climate change will have on transportation infrastructure located within the Passaic River Basin, of which Passaic County is a part of. The results of their analysis are included in the Passaic County HMP's risk assessment and their recommendations were shared with the Planning Partnership to reduce transportation asset vulnerability to climate change and increase resilience to existing and future heat or flooding events.
	Responsible Agency:	NJTPA
	Provides Funding for Mitigation:	Yes - planning
	Hazard:	All
U.S. Army Corps of Engineers (USACE)	**Description:**	The USACE has been working with NJDEP to mitigate flooding in Passaic County. Peckman River Basin, New Jersey The Peckman River Basin is located in Essex and Passaic Counties. The Peckman River is a tributary to the Passaic River and originates in the Township of West Orange and flows northeasterly through Verona, Cedar Grove, and Little Falls to its confluence with the Passaic River in Woodland Park. Extensive development in this basin has resulted in damages from flooding and ecosystem degradation. The Peckman River Basin experiences frequent flooding from intense thunderstorms and heavy rain events. These storms can deposit large amounts of precipitation in the watershed, producing significant runoff, which quickly surpasses the capacity of the river channel, and bridge and culvert openings. Significant degradation of the ecology of the basin has occurred as a result of extensive erosion at specific locations along the Peckman River. The development of the watershed has reduced the water-holding capacity of the landscape and altered the natural flow dynamics within the river system. As a result, the habitat suitability and ecological complexity of the river have been moderately impaired (USACE 2014). A favorable reconnaissance report was completed in July 2001. The report recommended a feasibility study to develop alternatives for flood damage reduction and ecosystem restoration in the Peckman River Basin. On March 14, 2002, a Feasibility Cost Sharing Agreement was executed between the USACE and the NJDEP. A draft feasibility report is expected to be completed by July 2015 (USACE 2014). Lower Passaic River The Lower Passaic River is the 17-mile tidally influenced portion of the Passaic River in northern New Jersey. The river flows from the Dundee Dam in the City of Clifton (Passaic County) to the confluence with Newark

Capability		
		Bay in the City of Newark (Essex County). The Lower Passaic River Study Area includes the 118-square mile watershed and tributaries, including the Saddle River, Second River, and Third River that drain into the Lower Passaic. The lower portion of the Lower Passaic River Basin is highly urbanized with significant development in its natural floodplains. The development within the basin has resulted in significant loss of floodplains, fish spawning habitat, benthic habitat, wetlands, waterfowl nesting areas, and other fish and aquatic and terrestrial habitat areas. In addition, the natural hydrologic regime of the basin has been altered by the construction of numerous flood control structures within the basin. The Lower Passaic River has a long history of industrialization, which has resulted in degraded water quality, sediment contamination, loss of wetlands, and abandoned or underutilized properties along the shore. In June 2000, the New York District initiated a reconnaissance study to identify and inventory water resources and sediment quality related problems and needs in the Hudson-Raritan Estuary. The reconnaissance study identified the Lower Passaic River as one of the priority restoration areas within the estuary. The Lower Passaic River has also been designated an Operable Unit of the Diamond Alkali Superfund Site, which is the subject of a Remedial Investigation and Feasibility Study (RI/FS) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). In recognition of the coincidental study areas and the related roles and responsibilities of the USEPA and USACE, along with the project sponsor (New Jersey Department of Transportation [NJDOT]), the agencies integrated the USEPA Superfund RI/FS and USACE Feasibility Study into one comprehensive cooperative effort. The coordinated effort was also a pilot project to coordinate remediation and restoration of degraded urban rivers in the U.S. under the Urban River Restoration Initiative (URRI). For the purpose of this study, a governmental partnership was formed and includes USACE, USEPA, NJDOT, NJDEP, NOAA, and U.S. Fish and Wildlife Service (USFWS), to assist in recommending a comprehensive solution for the Lower Passaic River Basin. The Lower Passaic River was also designated a location for Urban Waters Federal Partnership with USEPA and USACE as co-leads in February 2013. The purpose of this joint effort is to develop a comprehensive watershed-based plan for the remediation and restoration of the Lower Passaic River Basin. This plan will address the need for remedial actions as defined under CERCLA and also identify ecosystem restoration opportunities in the study area under the Water Resources Development Act (WRDA) to support broader estuary-wide restoration efforts. Remedial alternatives and ecosystem restoration measures will be coordinated to ensure that the overall solutions to the complex problems posed by the contamination in the area are protective of human health and the environment. USACE executed a Feasibility Cost-Sharing Agreement on June 30, 2003, with the NJDOT for a feasibility study for the tidally influenced portion of the Lower Passaic River, 17 miles below the Dundee Dam. In 2004, the USEPA entered into an administrative settlement with 31 companies to pay $10 million towards the RI/FS portion of the Lower Passaic River Restoration Project. The settlement agreement was amended in 2005 and 2007, adding more companies to reach a total of over 70 potential responsible parties. In 2007, a separate administrative settlement (AOC) was entered to take over the implementation of the Superfund portion of the joint feasibility study under USEPA oversight.

Capability		
		In June 2008, the USEPA signed an agreement with Occidental Chemical and Tierra Solutions to remove 200,000 cubic yards of contaminated sediment from the portion of the Lower Passaic River adjacent to the former Diamond Alkali facility in Newark. The first phase of the removal was completed in 2012 when 40,000 cubic yards was removed. In 2013, the USEPA and the Cooperating Parties Group (CPG) implemented a time-critical removal action to address highly contaminated surface sediments in Lyndhurst. Current efforts include evaluating potential remedial actions for sediments in the lower 8.3 miles of the river that could be implemented before the full RI/FS for the 17 miles is completed. The focused feasibility study by USEPA was released to the public in April 2014. A total of 49 restoration opportunities have been identified throughout the 17-mile watershed study area. Thirty eight out of the 49 sites have prepared conceptual plans and complete project summary sheets detailing the proposed restoration actions. Ongoing activities include ecological functional assessments, preparation of multiple conceptual plans, engineering designs, and cost estimates for the restoration sites, as well as coordination with planned remedial actions. The Passaic River draft feasibility study is available online at: http://www.ourpassaic.org/. Passaic River Basin General Re-Evaluation Study The USACE and NJDEP partnered to carry out the Passaic River General Re-Evaluation Study to determine the best flood risk management alternative to help communities throughout the Passaic River Basin. The re-evaluation is one of the 15 recommendations made by Governor Chris Christie's Passaic River Flood Advisory Commission. The study was kicked-off in June 2012 by the signing of a feasibility cost-sharing agreement between the USACE and the NJDEP. In spring 2014, the Passaic River Basin Flood Risk Management General Re-Evaluation Study Preliminary Alternative Analysis Report was completed and is now available to public. Six alternatives were re-evaluated based on today's existing conditions in the basin and new preliminary estimates of benefits and costs of each alternative were calculated. Using the preliminary benefit and cost estimates, the NJDEP requested that further, detailed analysis of three alternatives be undertaken in the second and final phases of the study. The three alternatives to be further analyzed include: • Alternative 14A – Alternative 14A includes levees and floodwalls combined with nonstructural measures (such as floodproofing, raising homes, and buyouts). It does not include channel improvements but does include the possibility of bridge and dam modifications to help reduce localized flooding. • Duel Inlet Newark Bay Outlet Tunnel – This alternative is the plan that was authorized by Congress after the 1987 study, with modifications that were developed with public input in the early 1990s. The most significant modification relocated the tunnel outlet from Third River to Newark Bay. • Nonstructural – This alternative involves addressing the flood risk management issues in the Passaic River Basin exclusively through non-structural measures (such as floodproofing, raising homes, and buyouts). The nonstructural measures would be in lieu of large-scale construction projects, like levees, floodwalls, diversion tunnels, and other measures that tend to have a greater impact on the environment than modifying existing buildings. These non-structural measures would only manage the flood risk to homes within the 10-year floodplain.

		Passaic River – Preservation of Natural Flood Storage Areas The USACE has been working on plans to reduce flooding in the basin since 1936, but no comprehensive plan has yet been implemented. Congress authorized a new study of the Passaic River Basin for the State of New Jersey in the WRDA of 1976 (Public Law 94-587) which led to a plan authorized in WRDA 1990 and modified in WRDA 1992, WRDA 1996, and WRDA 2000. The project includes several elements. The Preservation of Natural Flood Storage Areas element includes the acquisition of approximately 5,350 acres of natural storage areas, 5,200 acres of which are wetlands and could conceivably be developed, worsening existing flood problems. The State of New Jersey has agreed to continue to protect 6,300 floodway acres, thus avoiding any secondary development. About 9,500 acres of the Central Basin are already protected as designated parkland, bringing the total of natural flood storage areas that would be permanently protected with the project to 21,000 acres. The preservation element will prevent flood damages from becoming worse. It will not reduce flooding in the Passaic River Basin. The cost sharing is set at 75% federal and 25% state. The state, as a non-federal sponsor, may reduce its share by applying credits included in the authorization. The General Design Memorandum for the element was completed in July 1996 and the state requested that USACE proceed with its implementation at a current cost of $22.1 million (October 2003 price level). USACE completed a Real Estate Design Memorandum for purchasing the natural flood storage lands and executed a Project Cooperation Agreement with the state in June 1999. To date, over 3,400 acres have been acquired in fee, by conservation easement, or already held under state protection. USACE will continue to acquire lands with completion funds received in fiscal year 2010. Passaic River Basin Flood Management – Floodway Buy-Out As stated previously, the USACE has been working on plans to reduce flooding in the basin since 1936, but no comprehensive plan has yet been implemented. As described earlier in this section, Congress authorized a new study of the Passaic River Basin for the State of New Jersey in the WRDA of 1976 which led to a plan authorized in WRDA 1990 and modified in WRDA 1992, WRDA 1996, and WRDA 2000. The project includes several elements, which are currently being implemented throughout the basin. The Floodway Buy-Out element's cost sharing is set at 75% federal and 25% non-federal. The NJDEP is the non-federal sponsor. The Floodway Buy-out involves the acquisition and removal from the state defined floodway of approximately 800 homes in the municipalities of Fairfield, Lincoln Park, Wayne, Pompton Lakes, Montville, East Hanover, Pequannock, Little Falls, and Riverdale. These homes are subject to frequent flood damages as documented in the draft Floodway Buy-out Study prepared by the USACE in October 1995. The estimated cost of the buy-outs was $194,000,000 (October 1994 prices). The authorization specifies that the buy-outs are to be from willing sellers. The state began to implement the buy-outs through the state's Blue Acres Program in the late 1990's utilizing the draft report and $15,000,000 in state funding, which has been expended. Federal appropriations totaling $1,250,000 were made by Congress in fiscal years 2003, 2004, and 2005. The NJDEP indicated that it would act as the non-federal sponsor in 2004. USACE and the state have completed a limited update of the 1995 draft study. The report focused on two areas of the floodway in Hoffman Grove, Wayne and Pompton Lakes for acquisition and demolition of 30 homes as requested by the NJDEP. The limited update draft report and environmental assessment were released for public review in July 2005. A final report was issued in August 2005. A public meeting was held in September 2005 to solicit interest in the buyouts. The report

Capability		
		included an update of costs, benefits, an environmental assessment to meet National Environmental Policy Act requirements, and coordination with the involved communities. An additional $5 million were appropriated in 2010. The New York District team is updating the 2005 Limited Update Report which includes updating the environmental assessment, economic analysis, and cost estimate to 2014 price levels. USACE is working on Project Partnership Agreement (PPA) package and will submit to NJDEP for review and approval before sending it to USACE headquarters. Passaic River Flood Warning System The Passaic River Flood Warning System covers 935 square miles and contains 132 communities within New York and New Jersey counties: Bergen, Essex, Hudson, Morris, Passaic, Sussex, Somerset, Union, and Rockland. This area contains a population of approximately 2.5 million people and over 20,000 homes and businesses. The Passaic River Flood Warning System consists of 56 stream level gages and precipitation gages. The gages transmit observational data via individual Data Collection Platforms (DCPs) to the National Environmental Satellite, Data and Information Services (NESDIS) Geostationary Operational Environmental Satellite (GOES) system. The data is then retrieved by the USGS and made available on the internet for the use of the NWS in their forecasting of riverine flood events, emergency managers, and the general public. The USGS National Water Information System Web Interface uses the collected data to report near real-time river level stage elevations, river water discharge volumes, and in some cases, collected precipitation data. The observations form the basis for the river forecasts provided by the NWS. The NWS offices in Mount Holly (New Jersey) and Upton (New York) use these observations and river forecasts in their watch and warning responsibilities for flood and flash flood events. The NWS provides the observed and forecasted streamflow data, as well as watch warning and advisory information on the Advanced Hydrologic Prediction Services webpage. Additionally, real-time data can be obtained from the USGS WaterAlert System, which is a subscription notification service that sends subscribers real-time data via email or text. During fiscal year 2013, all 56 gages and data transmission components were reviewed and upgraded or replaced as needed to assure the collected data can be reliably delivered to the geostationary satellite. Normal operations and maintenance efforts continue within a partnership between the USACE and the USGS. The estimated operations and maintenance cost for fiscal year 2014 is $580,000
	Responsible Agency:	USACE
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood

5.3.2 Administrative and Technical Capability – County and Local

Table 5-3 summarizes the administrative and technical capabilities in Passaic County. Detailed information regarding administrative and technical capabilities in the County and the municipalities can be found in each jurisdictional annex found in Volume II, Section 9 (Jurisdictional Annexes).

Table 5-3. Administrative and Technical Capability – County and Local

Capability		
Passaic County Office of Emergency Management	**Description:**	The Passaic County Office of Emergency Management (OEM) acts as a coordinating agency among local, state, and federal agencies. The Passaic County OEM works in conjunction with county and municipal health agencies and health care providers, and emergency service personnel including police, fire, EMS, and the Sheriff's Office to coordinate responses in the event of an emergency. The mission of the Passaic County OEM is to provide expertise and leadership for the Department's emergency management responsibilities through the integration of emergency management programs, functions, and supporting activities to prevent, protect against, mitigate the effects of, respond to, and recover from all hazards. The Passaic County OEM staffs the Emergency Operations Center (EOC) which is a facility that provides coordinated emergency response, and also acts as staff to the liaison to the New Jersey Office of Emergency Management. Additionally, the Passaic County OEM is responsible for the following: • Alerting and notifying appropriate agencies during emergencies and disasters. • Ensuring resources are available and mobilized during large scale incidents. • Developing preparedness plans and procedures for response to and recovery from emergencies and disasters. • Developing and providing preparedness materials for the public. • Management and oversight of the Passaic County Emergency Operations Center (a facility which manages and coordinates emergency response for significant incidents.) • Partnership with the New Jersey Office of Emergency Management. Passaic County OEM is leading the 2020 Passaic County HMP update and hosting information about the HMP on their website (https://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php) including a link to the citizen survey. As mitigation grant funding becomes available, the OEM distributes information to the local offices of emergency management. The OEM maintains the County Continuity of Operations/Continuity of Government (COOP/COG), leads the Local Emergency Planning Committee (LEPC), and is leading the Hazard Mitigation Grant Program (HMGP)-Energy Allocation Initiative for the County. The OEM assists local agencies in the establishment of their emergency operations plan, which it then sends on to the New Jersey State Police Office of Emergency Management for final approval. The County and municipality file and apply for their own application through NJEMgrants. The OEM sponsors and participates in various exercises to evaluate various county agency and stakeholder abilities to respond to a situation, such as a natural hazard event.
	Responsible Agency:	Passaic County Office of Emergency Management
	Provides Funding for Mitigation:	No
	Hazard:	All
Passaic County Department of	**Description:**	The Passaic County Department of Planning and Economic Development serves as the staff resource for the Board of Chosen Freeholders, the Passaic County Planning Board, Passaic County Agriculture Development Board, and the Open Space Advisory Committee and Trust

Capability		
Planning and Economic Development		Fund. This department facilitates community development that offer citizens a high quality of life by meeting their needs for employment opportunities, an affordable home, efficient transportation, and access to leisure, recreational, and cultural opportunities. The department provides a process that assists citizens and community leaders in directing future changes in the county. Division of Planning In September 2014, the Board of Chosen Freeholders passed a resolution supporting the incorporation of guidelines for community assistance with the CRS. The Passaic County Division of Planning has partnered with the NY/NJ Baykeeper to support the program and is actively conducting outreach to interested communities and providing information and technical assistance through both in-person meetings and their website: http://www.passaiccountynj.org/index.aspx?NID=1041. The Division of Planning assists municipalities with their master plans through grant writing, visioning plans, and other partnerships that help build capacity. Division of Geographic Information Systems As part of the 2015 County HMP update, a county-wide critical facility inventory was developed and used to assess risk. The GIS Department will maintain this dataset for the county. Division of Economic Development Community Development Block Grant (CDBG) The Passaic County Department of Planning and Economic Development has managed the Passaic County CDBG program since 2008. Between 2008 and 2013, Passaic County has received grant awards totaling $5,343,405. The objective of this program is to assist low and moderate income residents and individuals with special needs/presumed benefit of Passaic County in the 12 participating communities of the county: Bloomingdale, Haledon, Hawthorne, Little Falls, North Haledon, Pompton Lakes, Prospect Park, Ringwood, Totowa, Wanaque, West Milford, and Woodland Park. In addition, non-profit agencies providing services to low to moderate income individuals in the 12 participating municipalities are also eligible to receive funding. Comprehensive Economic Development Strategy The Passaic County Board of Chosen Freeholders received a grant from the USEDA to develop a CEDS for Passaic County. The grant also includes an Economic Impact Analysis of Hurricane Irene on the Passaic County economy; and development of a Business Continuity Disaster Plan which incorporates resiliency planning to assist companies in their response to future disasters.
	Responsible Agency:	Passaic County Department of Planning and Economic Development
	Provides Funding for Mitigation:	Administers CDBG, CDBG-DR, USEDA
	Hazard:	All
Passaic County Planning Board	**Description:**	Prior to the issuance of any building permit by a municipal building official or any other agency or individual with authority to approve a site plan or issue a building permit, the site plan for any proposed land development along County roads or which will cause stormwater to drain either directly or indirectly to a County road or through any drainage-way, structure, pipe, culvert or facility for which the County

Capability		
		is responsible for the construction, maintenance or proper functioning shall be submitted to the County Planning Board for review and approval.
	Responsible Agency:	Board of Chosen Freeholders
	Provides Funding for Mitigation:	Yes In 2008, the Passaic County Planning Board adopted the Passaic County Corridor Enhancement Plan as an element of the Passaic County Master Plan to implement the program. As part of the plan, the County annually reports the funding available for improvements and enhancements by district. The County may use Corridor Enhancement funds to implement projects from the Morris Canal, Transportation and other elements of the Passaic County Master Plan that follow the principles of the Corridor Enhancement Plan.
	Hazard:	All
Passaic County Department of Engineering	**Description:**	The Passaic County Department of Engineering is charged with preparing plans, specifications, project management, and construction inspection of the county's capital improvement projects for the county's 125 bridges, 225 culverts, 248 miles of roadway, associated drainage, buildings, and parks projects. The department maintains plans and records of county infrastructure and assists the County Planning Board. Dam Emergency Action Plans (EAPs) are submitted to the state and county. For county-owned dams, EAPs are updated by the Passaic County Department of Engineering as required by NJDEP. This is considered sensitive information and does not appear in the dam failure risk assessment. Per the Site Plan and Subdivision Resolutions, the Passaic County Department of Engineering is responsible for inspecting all completed improvements required by the County Planning Board. The Department supported the update of the 2020 Passaic County HMP, is a member of the Steering Committee, and reviewed and contributed to the plan and County annex.
	Responsible Agency:	Passaic County Department of Engineering
	Provides Funding for Mitigation:	No
	Hazard:	All
Passaic County Open Space, Farmland and Historic Preservation Advisory Committee	**Description:**	Preserving open space and conserving natural resources ensure a sustainable quality of life in Passaic County. Acknowledging the need to preserve open space, historical sites, and farmland and improve the park system/facilities in Passaic County, two referenda were added to the November 1996 Election Ballot concurrently as non-binding ballots. The citizens approved an Open Space and Farmland Preservation Trust Fund referendum and an Open Space and Parks Improvement referendum, which were ultimately consolidated as a result of legislative initiative.
	Responsible Agency:	Board of Chosen Freeholders

Capability		
	Provides Funding for Mitigation:	Yes Each year, the county opens up grant funding requests from the Open Space, Farmland & Historic Preservation Trust Fund. Any of Passaic County's sixteen municipalities and qualified charitable conservancies are eligible to submit applications to the Open Space Trust Fund Advisory Committee. • Open Space Acquisition • Park Development • Historic Preservation
	Hazard:	Flood
Passaic County Road Department	**Description:**	The Passaic County Road Operations Division maintains and repairs all county roadways, culverts, catch basins, guide rails, and pavement on county bridges. This consists of 247 miles of roadway throughout 16 municipalities. Roadways are maintained curb to curb for pavement, drainage system, street cleaning, leaf collection and snow and ice control. Within County Right-of-Ways traffic signals and signal systems, regulatory, warning and guide signs and trees are maintained. The services and programs carried out by the Division are to provide for the safe passage of both motorists and pedestrians while using County roads. The County of Passaic shall be responsible for the removal and disposal of trees located within the County Right-of-Way which are deemed to be dead, diseased or dying and beyond recovery, or blown down or destroyed due to a windstorm or other natural disaster over which humans have no control.
	Responsible Agency:	Road Department
	Provides Funding for Mitigation:	No
	Hazard:	Coastal Storm, Flood, Severe Weather, Severe Winter Weather
Passaic County Department of Health	**Description:**	The Passaic County Department of Health is responsible for protecting and promoting the health of the total population of 510,000 people from 16 municipalities. All of the 16 municipalities are participating in "Bioterrorism Preparedness." The Department of Health is not a traditional public health service provider, however it has a well-organized infrastructure, and is a state certified County Environmental Health Act Agency. Passaic County HAZMAT is responsible for maintaining standardized county-wide HAZMAT and chemical, biological, radiological, nuclear, and explosive (CBRNE) emergency response capability, capacity, and competence. Passaic County HAZMAT is the lead agency for responding to HAZMAT emergencies by virtue of their certification from NJDEP and by the county ordinance. As part of their capability, the county HAZMAT has developed a network to coordinate with local fire departments that have local HAZMAT capabilities through formal interlocal agreements. The Department of Public Health has three interlocal agreements for HAZMAT services with Clifton and Wayne Fire Departments as well as Passaic County Sheriff's Department. These departments, in turn, must meet the qualifications set forth by NJDEP. Passaic

Capability		
		County HAZMAT and the three organizations listed above, must regularly attend training and medical surveillance to stay in compliance. They also regularly meet with our counterparts from other counties in the North Jersey Region and NJDEP's Bureau of Emergency Response to share and exchange useful information. There is the capability of sharing resources between counties should there be an incident that requires it. The Division of Mosquito Control is responsible for mosquito control throughout Passaic County, serving all residents, commercial business and recreational visitors. The Division works with the Health Department and Buildings & Grounds. The Rutgers Cooperative Extension of Passaic County is an educational outreach program of Cook College of Rutgers State University. The Cooperative Extension interacts with the Health Department, Planning Department and Senior Services.
	Responsible Agency:	Department of Health
	Provides Funding for Mitigation:	No
	Hazard:	All
Passaic County Parks and Recreation	**Description:**	Parks and Recreation oversees more than 16,000 acres of preserved open space and recreational facilities located throughout Passaic County.
	Responsible Agency:	Passaic County Parks and Recreation
	Provides Funding for Mitigation:	No
	Hazard:	Infestation and Invasive Species
Sustainable Jersey	**Description:**	Sustainable Jersey is a nonprofit organization that provides tools, training and financial incentives to support communities as they pursue sustainability programs. By supporting community efforts to reduce waste, cut greenhouse gas emissions, and improve environmental equity, Sustainable Jersey aims to empower communities to build a better world for future generations. The organization also offers a certification program. Sustainable Jersey certification is a designation for municipal governments in New Jersey. All actions taken by municipalities to score points toward certification must be accompanied by documentary evidence and is reviewed. The certification is free and completely voluntary.
	Responsible Agency:	-
	Provides Funding for Mitigation:	No
	Hazard:	All

5.4 FISCAL CAPABILITIES

Fiscal capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions. The table below provides a list of programs, descriptions, and links for those jurisdictions seeking funding sources. This table is not intended to be a comprehensive list, but rather a tool to help begin identifying potential sources of funding.

Table 5-4. Fiscal Capabilities

Capability		
Federal		
Hazard Mitigation Grant Program	**Description:**	The HMGP is a post-disaster mitigation program. FEMA makes these grants available to states by after each federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures and can be used to fund cost-effective projects that will protect public or private property or that will reduce the likely damage from future disasters in an area covered by a federal disaster declaration. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements, and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved HMP (this plan). Additional information regarding the HMGP is available on the FEMA website: https://www.fema.gov/hazard-mitigation-grant-program Passaic County has received HMGP funding, including funding to purchase generators to provide continuity of operations during utility failures.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Flood Mitigation Assistance Program	**Description:**	The FMA program combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. The FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is at least 75 percent. For the nom-federal share, at most 25 percent of the total eligible costs must be provided by a non-federal source; of this 25 percent, no more than half can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. The FMA funds are distributed from FEMA to the state. NJOEM serves as the grantee and program administrator for the FMA program. The FMA program is detailed on the FEMA website: https://www.fema.gov/flood-mitigation-assistance-grant-program.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
	Description:	The PDM program is an annually funded, nationwide, competitive grant program. No disaster declaration is required. Federal funds will cover 75 percent of a project's cost

Capability		
Pre-Disaster Mitigation Program		up to $3 million. As with the HMGP and FMA, a FEMA-approved local HMP is required to be approved for funding under the PDM program. The PDM program is detailed on the FEMA website: https://www.fema.gov/pre-disaster-mitigation-grant-program. Passaic County used the PDM program to fund this 2020 HMP update.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Individual Assistance	**Description:**	Individual Assistance (IA) provides help for homeowners, renters, businesses, and some non-profit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses could be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals are allowed to borrow up to $200,000 to repair or replace real estate, $40,000 to cover losses to personal property, and an additional 20 percent for mitigation. For businesses, loans could be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible. Non-profit organizations, such as charities, churches, and private universities are eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster but are restricted by law to small businesses only. IA is detailed on the FEMA website: https://www.fema.gov/individual-disaster-assistance.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Public Assistance	**Description:**	Public Assistance (PA) provides cost reimbursement aid to local governments (state, county, local, municipal authorities, and school districts) and certain non-profit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services. This program is largely funded by FEMA with both local and state matching contributions required. PA is detailed on the FEMA website: https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Department of Homeland Security Grant Program	**Description:**	The Homeland Security Grant Program (HSGP) plays an important role in the implementation of the National Preparedness System by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation. In FY 2019, the total amount of funds available under HSGP was $1.095 billion. HSGP is comprised of three interconnected grant programs including the State Homeland Security Program, Urban Areas Security Initiative (UASI), and the Operation Stonegarden. Together, these grant programs fund a range of preparedness

Capability		
		activities, including planning, organization, equipment purchase, training, exercises, and management and administration. Passaic County is part of the Jersey City/Newark UASI region. The UASI program provides funding to address the unique multi-discipline planning, operations, equipment, and training and exercise needs of high-threat, high-density urban areas and to assist in building and sustaining capabilities related to terrorism prevention, protection, mitigation, response, and recovery. Additional information regarding HSGP is available on the website: https://www.fema.gov/homeland-security-grant-program.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Fire Management Assistance Grant Program	**Description:**	Assistance for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster. Provides a 75% federal cost share and the state pays the remaining 25% for actual cost. Information on this program is available on the website: https://www.fema.gov/fire-management-assistance-grant-program.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Wildfire
Assistance to Firefighters Grant Program	**Description:**	The primary goal of the Assistance to Firefighters Grants is to enhance the safety of the public and firefighters with respect to fire-related hazards by providing direct financial assistance to eligible fire departments, nonaffiliated Emergency Medical Services organizations, and State Fire Training Academies. This funding is for critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience. Information regarding this grant program is available on the website: https://www.fema.gov/welcome-assistance-firefighters-grant-program.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
High Hazard Potential Dams Grant Program	**Description:**	The Rehabilitation of High Hazard Potential Dams Grant Program provides technical, planning, design, and construction assistance in the form of grants to non-Federal governmental organizations or nonprofit organizations for rehabilitation of eligible high hazard potential dams. Information regarding this program is available on the website: https://www.grants.gov/web/grants/view-opportunity.html?oppId=316238.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Dam Failure

Capability		
Small Business Administration Loan	**Description:**	The Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets. Homeowners could apply for up to $200,000 to replace or repair their primary residence. Renters and homeowners could borrow up to $40,000 to replace or repair personal property-such as clothing, furniture, cars, and appliances that were damaged or destroyed in a disaster. Physical disaster loans of up to $2 million are available to qualified businesses or most private nonprofit organizations. Additional information regarding SBA loans is available on the SBA website: https://www.sba.gov/managing-business/running-business/emergency-preparedness/disaster-assistance.
	Responsible Agency:	SBA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Community Development Block Grant Program	**Description:**	CDBG are federal funds intended to provide low and moderate-income households with viable communities, including decent housing, a suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, and planning and administration. Public improvements could include flood and drainage improvements. In limited instances and during the times of "urgent need" (e.g., post disaster) as defined by the CDBG National Objectives, CDBG funding could be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. Additional information regarding CDBG is available on the website: https://www.hudexchange.info/programs/cdbg-entitlement/. In Passaic County, the following municipalities are eligible for CDBG funding: • Bloomingdale • Haledon • Hawthorne • Little Falls • North Haledon • Pompton Lakes • Prospect Park • Ringwood • Totowa • Wanaque • West Milford • Woodland Park
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Federal Highway Administration-	**Description:**	The Federal Highway Administration (FHWA) Emergency Relief is a grant program through the U.S. Department of Transportation (DOT) that can be used for repair or reconstruction of federal-aid highways and roads on federal lands that have suffered

Capability		
Emergency Relief		serious damage as a result of a disaster. New Jersey Department of Transportation serves as the liaison between local municipalities and FHWA. Additional information regarding the FHWA Emergency Relief Program is available on the website: https://www.fhwa.dot.gov/programadmin/erelief.cfm.
	Responsible Agency:	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Federal Transit Administration - Emergency Relief	**Description:**	The Federal Transit Authority (FTA) Emergency Relief is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. Administered by the Federal Transit Authority at the U.S. DOT and directly allocated to Metropolitan Transit Authority (MTA) and Port Authority, this transportation-specific fund was created as an alternative to FEMA PA. Currently, a total of $5.2 billion has been allocated to New Jersey-related entities. Additional information regarding the FTA Emergency Relief Program is available on the website: https://www.transit.dot.gov/funding/grant-programs/emergency-relief-program/emergency-relief-program.
	Responsible Agency:	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Disaster Housing Program	**Description:**	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage and rental assistance available through the U.S. Department of Housing and Urban Development (HUD). Information on this program is available on the website: https://www.hud.gov/program_offices/public_indian_housing/publications/dhap.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
HOME Investment Partnerships Program	**Description:**	Grants to local and state government and consortia for permanent and transitional housing, (including financial support for property acquisition and rehabilitation for low income persons). Information on this program is available on the website: https://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	-
HUD Disaster Recovery Assistance	**Description:**	Grants to fund gaps in available recovery assistance after disasters (including mitigation). Information on this program is available on the website: https://www.hud.gov/info/disasterresources.
	Responsible Agency:	HUD

Capability		
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Section 108 Loan Guarantee	**Description:**	Enables states and local governments participating in the CDBG program to obtain federally guaranteed loans for disaster-distressed areas. Information on this program is available on the website: https://www.hudexchange.info/programs/section-108/.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Smart Growth Implementation Assistance program	**Description:**	The Smart Growth Implementation Assistance (SGIA) program through the U.S. Environmental Protection Agency (EPA) focuses on complex or cutting-edge issues, such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under 4 categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design, or medical and social service facilities siting. Information on this program is available on the website: https://www.epa.gov/smartgrowth.
	Responsible Agency:	EPA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Partners for Fish and Wildlife	**Description:**	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats. Information on this program is available on the website: https://www.fws.gov/partners/.
	Responsible Agency:	U.S. Fish and Wildlife Service
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Transportation Investment Generating Economic Recovery (TIGER)	**Description:**	Investing in critical road, rail, transit and port projects across the nation. Information on this program is available on the website: https://www.transportation.gov/tags/tiger-grants.
	Responsible Agency:	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Community Facilities Direct Loan & Grant Program	**Description:**	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings.

Capability		
		Information on this program is available on the website: https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Emergency Loan Program	**Description:**	USDA's Farm Service Agency provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine. Information on this program is available on the website: https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/index.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	All natural hazards
Emergency Watershed Protection program	**Description:**	The Emergency Watershed Protection (EWP) program provides assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences through the Natural Resources Conservation Service. Information on this program is available on the website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	All-natural hazards
Financial Assistance	**Description:**	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land. Information on this program is available on the website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/.
	Responsible Agency:	NRCS
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Emergency Management Performance Grants (EMPG) Program	**Description:**	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities. Information on this program is available on the website: https://www.fema.gov/emergency-management-performance-grant-program
	Responsible Agency:	U.S. DHS
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Reimbursement for Firefighting	**Description:**	Provides reimbursement only for direct costs and losses over and above normal operating costs.

Capability		
on Federal Property		Information on this program is available on the website: https://www.usfa.fema.gov/grants/firefighting_federal_property.html.
	Responsible Agency:	U.S. DHS
	Provides Funding for Mitigation:	Yes
	Hazard:	Fire
Land & Water Conservation Fund	**Description:**	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies). Information on this program is available on the website: https://www.nps.gov/subjects/lwcf/index.htm.
	Responsible Agency:	National Park Service
	Provides Funding for Mitigation:	Yes
	Hazard:	-
State		
New Jersey Clean Energy Program	**Description:**	New Jersey's Clean Energy Program (NJCEP) promotes increased energy efficiency and the use of clean, renewable sources of energy including solar, wind, geothermal, and sustainable biomass. The results for New Jersey are a stronger economy, less pollution, lower costs, and reduced demand for electricity. NJCEP offers financial incentives, programs, and services for residential, commercial, and municipal customers. Refer to https://www.njcleanenergy.com/main/about-njcep/about-njcep for additional details on NJCEP. The program also offers a Community Energy Plan Grant for government entities (e.g. municipality, county, Green Team or environmental commission, or other Sustainable Jersey organization within a community or county). The grant will provide funding for an entity to create a Community Energy Master Plan to align local communities with the State Energy Master Plan
	Responsible Agency:	New Jersey Board of Public Utilities
	Provides Funding for Mitigation:	Yes
	Hazard:	Hazards impacted by climate change
Grant and Loan Programs	**Description:**	NJDEP offers a wide variety of funding opportunities for local governments and other types of organizations to fund numerous environmentally based projects. This includes funding for: air quality, energy, and sustainability; compliance and enforcement; engineering and construction; land use management; local government assistance; natural and historic resources; site remediation and waste management programs; and water resource management. Information on each of the programs can be found on the NJDEP website: https://www.nj.gov/dep/grantandloanprograms/.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Green Acres Program	**Description:**	Green Acres was created to meet New Jersey's growing recreation and conservation needs. This program has helped preserve over 1.2 million acres of land in New Jersey.
	Responsible Agency:	NJDEP

Capability		
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Blue Acres Program	**Description:**	Blue Acres provides funding for acquisition of land in floodways of the Delaware River, Passaic River, and Raritan River and their respective tributaries, for recreation and conservation purposes. Properties (including structures) that have been damaged by, or may be prone to incurring damage caused by, storms or storm-related flooding, or that may buffer or protect other lands from such damage, are eligible for acquisition.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
New Jersey Water Bank	**Description:**	The New Jersey Water Bank (NJWB) is a partnership between the NJDEP and the NJEIT to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water. The NJWB finances projects by utilizing two funding sources. The Trust issues revenue bonds which are used in combination with zero percent interest funds to provide very low interest loans for water infrastructure improvements. The NJDEP administers a combination of Federal State Revolving Fund capitalization grants, as well as the State's matching funds, loan repayments, State appropriations and interest earned on such funds.
	Responsible Agency:	NJDEP and New Jersey Environmental Infrastructure Trust
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
New Jersey Redevelopment Authority	**Description:**	The New Jersey Redevelopment Authority (NJRA) is an independent state financing authority committed exclusively to the redevelopment of New Jersey's urban areas. NJRA offers several financing resources including site acquisition funding, predevelopment assistance, several development assistance resources, and technical assistance.
	Responsible Agency:	-
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Department of Community Affairs	**Description:**	The New Jersey Department of Community Affairs (NJDCA) is a state agency created to provide administrative guidance, financial support, and technical assistance to local governments, community development organizations, businesses, and individuals to improve the quality of life in New Jersey. NJDCA offers a wide range of programs, funding, and services that respond to issues of public concern including fire and building safety, housing production, community planning and development, and local government management and finance. Among other funding sources, NJDCA administers CDBG funding and is typically the CDBG-Disaster Relief funding recipient for the State of New Jersey.
	Responsible Agency:	-
	Provides Funding for Mitigation:	Yes
	Hazard:	-

Capability		
New Jersey Board of Public Utilities	**Description:**	The New Jersey Board of Public Utilities (BPU) works with private utility companies to provide analysis of natural hazard information affecting the provision of electric power, telecommunications, public water, sewage collection and treatment, and other regulated public utilities. The data are used during response and recovery efforts in the event of emergency or disaster and is also used to analyze impact of mitigation plans and projects. BPU also provides technical assistance for the Energy Resiliency Program
	Responsible Agency:	BPU
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Environmental Infrastructure Financing Program	**Description:**	Qualified borrowers receive loans in two equal parts: Approximately one half to three quarters comes from a 0-interest State Revolving Fund maintained by the NJDEP. The other portion comes from proceeds of highly rated tax-exempt revenue bonds sold by the Trust. Combining these two funds results in a loan that is 50 to 75% lower than traditional loan rates.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Small Cities Communities Development Block Grants	**Description:**	The New Jersey Small Cities Communities Development Block Grants provide funds for economic development, housing rehabilitation, community revitalization, and public facilities designated to benefit people with low and moderate incomes, or to address recent local needs for which no other source of funding is available to non-entitlement counties and municipalities. Information on the program is available on the website: https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html.
	Responsible Agency:	NJDCA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Conservation Foundation	**Description:**	The New Jersey Conservation Foundation (NJCF) is a private, not-for-profit organization. Through acquisition and stewardship, NJCF protects strategic lands, promotes strong land use policies, and forges partnerships to achieve conservation goals. Grants to help fund preservation activities. Information on the program is available on the website: https://www.njconservation.org/what-we-do/.
	Responsible Agency:	NJCF
	Provides Funding for Mitigation:	Yes
	Hazard:	-
The New Jersey Infrastructure Bank	**Description:**	Two programs provide and administer low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Approximately $350 million is awarded annually. 1. NJEIT for the purpose of financing water quality infrastructure projects that enhance ground and surface water resources, ensure the safety of drinking water supplies, protect the public health and make possible responsible and sustainable economic development. 2. The New Jersey Transportation Infrastructure Bank (NJTIB) is an independent State Financing Authority responsible for providing and administering low interest

Capability		
		rate loans to qualified municipalities, counties, and regional authorities in New Jersey for the purpose of financing transportation quality infrastructure projects. Information on the program is available on the website: https://www.njib.gov/.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Drinking Water State Revolving Fund	**Description:**	The DWSRF program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Infrastructure Trust funds. Additionally, the Water Supply program provides operator licensing and training support as well as financial assistance through the DWSRF program. Information on the program is available on the website: https://www.state.nj.us/dep/watersupply/dws_loans.html.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Department of Transportation (NJDOT)	**Description:**	Funding of the Program is typically federal through the Federal Highway Administration or State through the Transportation Trust Fund. Information on the program is available on the website: https://www.state.nj.us/transportation/business/localaid/funding.shtm.
	Responsible Agency:	NJDOT
	Provides Funding for Mitigation:	Yes
	Hazard:	-
NJ Highlands Council – Open Space Partnership	**Description:**	The Highlands Open Space Partnership Funding program is a matching grant program designed to support the acquisition of property for the protection of resources within the Highlands Region, and to further the goals of landowner equity as specified in the Highlands Water Protection and Planning Act of 2004 and the Highlands Regional Master Plan. The Highlands Council shall provide a maximum grant award of 50% of the total purchase price of the property. Applications will be considered for acquisition of property in fee simple or through conservation easements for any passive recreation or conservation purposes. See program details below for complete information.
	Responsible Agency:	NJ Highlands Council. State agencies, Highlands county or municipal governments, and charitable conservancies are eligible to apply.
	Provides Funding for Mitigation:	Yes – open space
	Hazard:	-
NJ Highlands Council – Plan Conformance Grants	**Description:**	Plan Conformance Grants provide funding to support costs associated with Plan Conformance activities (i.e. engagement of professionals and staff in the development of required Plan Conformance components).
	Responsible Agency:	Municipalities in the Highlands Region, as defined by the Highlands Act (Planning or Preservation Area), that have submitted a duly-adopted Notice of Intent to petition Highlands Council in accordance with the Council's Plan Conformance Guidelines.
	Provides Funding for Mitigation:	Yes
	Hazard:	Harmful Algal Bloom

Capability		
NJ Highlands – Transfer of Development Rights	**Description:**	Transfer of Development Rights (TDR) is a land-use tool that encourages transfer of development potential from areas a community wants to preserve (Sending Zones) to areas where growth is desired (Receiving Zones). The Highlands Act mandated the creation of a TDR program as an effective means of addressing landowner equity while advancing planning goals of the Act.
	Responsible Agency:	Any municipality in New Jersey can apply for funding.
	Provides Funding for Mitigation:	Yes
	Hazard:	-
County and Local		
Passaic County Open Space Acquisition Grant	**Description:**	Preserving open space and conserving natural resources ensure a sustainable quality of life in Passaic County. Acknowledging the need to preserve open space, historical sites, and farmland and improve the park system/facilities in Passaic County, two referenda were added to the November 1996 Election Ballot concurrently as non-binding ballots. The citizens approved an Open Space and Farmland Preservation Trust Fund referendum and an Open Space and Parks Improvement referendum, which were ultimately consolidated as a result of legislative initiative. Each year, the county opens up grant funding requests from the Open Space, Farmland & Historic Preservation Trust Fund. Any of Passaic County's sixteen municipalities and qualified charitable conservancies are eligible to submit applications to the Open Space Trust Fund Advisory Committee.
	Responsible Agency:	Board of Chosen Freeholders, Passaic County Open Space, Farmland and Historic Preservation Advisory Committee
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Passaic County Historic Preservation Grant	**Description:**	This fund was established by the Passaic County Board of Chosen Freeholders to help support the preservation of the County's abundance of historic resources. Any of Passaic County's sixteen municipalities and qualified charitable conservancies are eligible to submit applications to the Open Space Trust Fund Advisory Committee.
	Responsible Agency:	Board of Chosen Freeholders, Passaic County Open Space, Farmland and Historic Preservation Advisory Committee
	Provides Funding for Mitigation:	Yes
	Hazard:	All

5.5 PLAN INTEGRATION

Described earlier in this section and within each annex, participating jurisdictions identified integration of hazard risk management into their existing planning, regulatory, and operational/administrative framework ("integration capabilities") and intended integration promotion (integration actions). Volume II, Section 9 (Jurisdictional Annexes) provides details on how each jurisdiction integrates hazard mitigation into their existing capabilities.

5.5.1 Integration Process

Hazard mitigation is a sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Integrating hazard mitigation into a community's existing plans, policies, codes, and programs leads to development patterns that do not increase risk from known hazards or leads to redevelopment that reduces risk from known hazards. The Passaic County Planning Partnership was tasked with identifying how hazard mitigation is integrated into existing planning mechanisms. Section 9 (Jurisdictional Annexes) details how this is done for each participating municipality and the County. During this process, many municipalities

recognized the importance and benefits of incorporating hazard mitigation into future municipal planning and regulatory processes and have added new mitigation actions to support this effort.

The Planning Partnership representatives will continue to incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will continue to work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution presented in Appendix A (Plan Adoption) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

1. Hazard mitigation planning will be formally recognized as an integral part of overall planning and emergency management efforts.
2. The Hazard Mitigation Plan, Master Plans, Emergency Management Plans, and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of County residents.

Section 7 (Plan Maintenance) provides for additional information on the implementation of the mitigation plan through existing programs.

SECTION 6. MITIGATION STRATEGY

This section presents the process by which Passaic County will reduce or eliminate potential losses from the hazards identified in Section 4.1 (Identification of Hazards) of this HMP. The mitigation strategy focuses on existing and potential future mitigation actions to alleviate the effects of hazards on Passaic County's population, economy, environment and general building stock.

The Planning Partnership reviewed the results of the risk assessment and capability assessment to identify and develop mitigation actions. This section includes the following. Individual actions are listed within Section 9 (Jurisdictional Annexes).

1. Background and Past Mitigation Accomplishments
2. General Planning Approach
3. Review and Update of Mission Statement, Mitigation Goals and Objectives
4. Mitigation Strategy Development

Hazard mitigation reduces the potential impacts of, and costs associated with, emergency and disaster-related events. Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

Mitigation actions can include activities such as: revisions to land-use planning, training and education, and structural and nonstructural safety measures.

2020 HMP Changes

- The goals and objectives were updated to align with County and local priorities.
- The capability assessment was moved to Section 5.
- A Strengths, Weaknesses, Obstacles and Opportunities exercise was conducted for the high-ranked hazards to inform the updated mitigation strategy.
- A mitigation toolbox was compiled and distributed to assist with the mitigation strategy update.

6.1 BACKGROUND AND PAST MITIGATION ACCOMPLISHMENTS

In accordance with the requirements of the DMA 2000, a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this plan update. Passaic County, through previous and ongoing hazard mitigation activities, has demonstrated that it is proactive in protecting its physical assets and citizens against losses from natural hazards. Examples of previous and ongoing Passaic actions and projects include the following. Refer to Section 9.2 through 9.17 for mitigation accomplishments by each municipality.

- The County is currently drafting a Debris Management Plan that will include all municipalities.
- When the County performs roadwork, the stormwater infrastructure is upgraded to meet the minimum standard of an 18-inch pipe, unless bigger is needed for the design.
- During Planning Board review, any new development the stormwater cannot go into the system, so they are required to build detention basins/seepage pits.
- A draft Green Stormwater Infrastructure Element has been developed as part of the Master Plan.
- The County performed Haledon Avenue Green Streets green infrastructure project in Paterson utilizing NJDEP 319h grant ($495,251).
- Passaic County was part of the NJTPA Passaic River Basin Climate Resilience Planning Study and integrated the data into this HMP risk assessment, and considered the study recommendations to reduce transportation vulnerability to heat and flood events.

- The County Department of Parks and Recreation have removed over 200 ash trees and continue to treat about 30 in an attempt to save them from Emerald Ash Borer.
- The Department of Engineering includes design measures per NJDEP standards when conducting capital projects (i.e., when working on bridges scour protection is installed).
- Permanent generators have been installed at the following critical facilities:
  - Gas facility at golf course (FEMA HMA grant)
  - Jail (FEMA HMA grant)
  - Communications Tower (NJ Transit)
  - County EOC
  - Alternate EOC (Police Academy)
  - County owned-gas stations
  - Preakness Healthcare – shelter for senior citizens
  - Administration Facility
  - Sheriff's Department

- The County installs scour protection when working on bridges. The County conducted a scour countermeasure project for 10 County structures (NJDOT has a scour critical list of bridges, and 13 on the list last year, at end of 2020 there will be one remaining). This work is funded through NJDOT and the County.
- The County Engineering Department has performed approximately 550 drain inlet retrofits/replacements countywide between 2015 and 2019.
- The County Engineering Department has completed stormwater infrastructure upgrades at the following locations:
  - Broad Street, Clifton
  - East Main Street and Francisco Avenue, Little Falls
  - Margaret King Road, Ringwood
  - Greenwood Lake Turnpike, West Milford

6.2 GENERAL MITIGATION PLANNING APPROACH

The overall approach used to update the County and local hazard mitigation strategies are based on FEMA and State of New Jersey regulations and guidance regarding local mitigation plan development, including the following:

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning).
- FEMA *Local Mitigation Planning Handbook*, March 2013.
- FEMA *Local Mitigation Plan Review Guide*, October 1, 2011.
- FEMA *Integrating Hazard Mitigation into Local Planning*, March 1, 2013.
- FEMA *Plan Integration: Linking Local Planning Efforts*, July 2015.
- FEMA *Mitigation Planning How-To Guide #3, Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3), February 2013.
- FEMA *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, January 2013.

The mitigation strategy update approach includes the following steps that are further detailed in later subsections of this section:

- Section 6.3 – Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise
- Section 6.4 – Stakeholder Surveys
- Section 6.5 – Review and update the mitigation goals and objectives
- Section 6.6 – Prepare an implementation strategy, including:
  - Identification of progress on previous County and local mitigation strategies

- Development of updated County and local mitigation strategies, and
- Prioritization projects and initiatives in the updated mitigation strategy

6.3 STRENGTHS, WEAKNESSES, OBSTACLES AND OPPORTUNITIES EXERCISE

On January 23, 2020, the Planning Partnership participated in a Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise focusing on the high-ranked countywide hazards to update the strengths, weaknesses, obstacles and opportunities since conducted in 2014. The discussion of each hazard began with identifying County, local jurisdiction and stakeholder strengths to mitigate the risk and potential future impacts of these hazards. Next, the weaknesses, challenges and obstacles the planning area faces to reduce each hazard's risk were identified. To conclude the discussion of each high-ranked hazard, the meeting attendees were asked to identify potential opportunities for enhanced mitigation.

Each jurisdiction was then asked to complete a worksheet to document strengths, weaknesses, obstacles and opportunities relevant to their jurisdiction for their high-ranked hazards. SWOO results were recorded to assist with the problem statement development to update to their mitigation strategy. The following summarizes the five general categories of potential opportunities identified during the session. Refer to Appendix B (Participation Documentation) which provides the information captured for each hazard during the SWOO session.

- Address challenges with financial resources
- Increase and enhance local capabilities
- Reduce vulnerability to hazards

6.4 STAKEHOLDER SURVEYS

As discussed in Section 2 (Planning Process), stakeholder surveys were developed and distributed to solicit input regarding vulnerabilities, capabilities and mitigation projects. The County distributed directly via email to identified points of contact in the following sectors. In addition, all Planning Partners were asked to distribute broadly within their jurisdictions.

- Academia
- Emergency services
- Transportation/Department of Public Works
- Utilities
- Hospital and health care
- Business/commerce
- Social services
- General - for planning agencies and other stakeholders that do not fit within one of the above categories

Information gathered from these surveys was shared with all plan participants and used to inform the updated mitigation strategy development and finalization of the annexes (Section 9). Refer to Appendix D (Public and Stakeholder Outreach) for a copy of the survey results.

6.5 REVIEW AND UPDATE OF MITIGATION GOALS AND OBJECTIVES

This section documents the County's efforts to develop hazard mitigation goals and objectives that are established to reduce or avoid long-term vulnerabilities to the identified hazards.

6.5.1 Goals and Objectives

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." The mitigation goals were developed based on the risk assessment results, discussions, research, and input from the Steering and Planning Committees, existing authorities, polices, programs, resources, stakeholders, and the public.

The Steering Committee reviewed the 2015 HMP goals and objectives at the August 2019 Steering Committee kickoff meeting. The updated goals and objectives were then presented to the Planning Partnership at the October 2019 municipal kickoff meeting. The goals and objectives were updated in consideration of the hazard events and losses since the 2015 plan, the goals and objectives established in the updated State HMP, county and local risk management plans/priorities, as well as direct input from the Steering Committee (representing the County and participating jurisdictions) recognizing the need to move forward to best manage their hazard risk.

FEMA defines ***Goals*** as general guidelines that explain what should be achieved. Goals are usually broad, long-term, policy statements, and represent a global vision.

FEMA defines ***Objectives*** as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible.

FEMA defines ***Mitigation Actions*** as specific actions that help to achieve the mitigation goals and objectives.

For the purposes of this plan, goals and objectives are defined as follows:

Goals are general guidelines that explain what is to be achieved. They are broad, long-term, policy-type statements that represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

Objectives are short-term aims, which when combined form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

The goals and objectives update provides clear guidelines for how the County and all jurisdictions can move forward to best manage their hazard risk. Amendments include additions and edits to goals and objectives to express the plan participants' interests in integrating this plan with other planning mechanisms/programs and to support mitigation through the protection and preservation of natural systems, incorporate resilience of lifelines, and integrate green infrastructure.

As a result of this review process, the goals and objectives for the 2020 update were amended as presented in Table 6-1. *Italicized* text indicates the updates made to the goals and objectives. A new goal was added and move to Goal #1, and the goals and objectives that follow were renumbered. Although an objective is listed with each goal, the objectives were developed to meet multiple goals as demonstrated in Table 6-2.

Table 6-1. Passaic County Mitigation Goals and Objectives

Goal	Objective
Goal 1: Protect Life	1.1: Improve warning and emergency communications systems
	1.2: Reduce the impacts of hazards on people, property, and vulnerable populations
	1.3: Maintain and strengthen local regulatory standards including full and effective building code enforcement, floodplain management, and other vulnerability-reducing regulations
Goal 2: Protect Property	2.1. Protect *and increase resilience* of critical facilities *and lifelines*
	2.2: Reduce repetitive and severe repetitive losses

Goal	Objective
	2.3: Protect environmental resources that serve a natural hazard mitigation function
	2.4: Encourage cost-effective and environmentally-sound development and land use
	2.5: Facilitate development and timely submittal of project applications meeting state and federal guidelines for funding for repetitive and severe repetitive loss properties and hardening/retrofitting infrastructure and critical facilities with highest vulnerability rankings
	2.6: Encourage the use of green stormwater infrastructure
Goal 3: Increase Public Preparedness and Awareness	3.1: Improve education and outreach efforts regarding risk, the potential impacts of hazards, and the identification of specific measures that can be taken to reduce their impact
	3.2: Improve data collection, use, and sharing to reduce the impacts of hazards
	3.3: Provide for user-friendly hazard data accessibility for mitigation and other planning efforts and for private citizens
Goal 4: Develop and maintain an understanding of risks from hazards	4.1: Acquire and maintain detailed critical facilities *and lifelines* such that these sites can be prioritized and risk-assessed for possible mitigation actions
	4.2: Improve hazard data available to the county and participating communities for use in future planning efforts
	4.3: Incorporate new state and FEMA guidance, rules, and regulations into the HMP
	4.4: *Strengthen understanding of, and adaptation to, a changing climate*
Goal 5: Enhance county and local mitigation capabilities to reduce hazard vulnerabilities	5.1: Increase local government official awareness regarding mitigation planning, project identification and funding opportunities for mitigation
	5.2: Provide government officials and local practitioners with educational opportunities and information regarding best practices for hazard mitigation planning, project identification, and implementation
	5.3: Improve capabilities, coordination, and opportunities at municipal and county levels to plan and implement hazard mitigation projects, programs, and activities
	5.4: Support increased participation in the National Flood Insurance Community Rating System
	5.5 Support increased integration of municipal/county hazard mitigation planning and floodplain management with effective municipal/county zoning regulation, subdivision regulation, and comprehensive planning implementation
Goal 6: Support continuity of operations pre-, during and post-hazard events	6.1: Ensure continuity of operations of essential county *and municipal* government services
	6.2: Increase resiliency by facilitating rapid disaster recovery
	6.3: Support and encourage the implementation of alternative energy sources

Table 6-1. Passaic County Hazard Mitigation Plan Objectives meeting multiple Goals

Obj. #	Objective Statement	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6
1.1	Improve warning and emergency communications systems.	X		X		X	X
1.2	Reduce the impacts of hazards on people, property, and vulnerable populations.	X	X	X		X	X
1.3	Maintain and strengthen local regulatory standards including full and effective building code enforcement, floodplain management, and other vulnerability-reducing regulations.	X	X		X	X	
2.1	Protect and increase resilience of critical facilities and lifelines.	X	X				X
2.2	Reduce repetitive and severe repetitive losses.	X	X				
2.3	Protect environmental resources that serve a natural hazard mitigation function.	X	X			X	
2.4	Encourage cost-effective and environmentally-sound development and land use.	X	X			X	
2.5	Facilitate development and timely submittal of project applications meeting state and federal guidelines for funding for repetitive and severe repetitive loss properties and hardening/retrofitting infrastructure and critical facilities with highest vulnerability rankings	X	X		X	X	
2.6	Encourage the use of green stormwater infrastructure.	X	X				X
3.1	Improve education and outreach efforts regarding risk, the potential impacts of hazards, and the identification of specific measures that can be taken to reduce their impact			X			X
3.2	Improve data collection, use, and sharing to reduce the impacts of hazards.				X	X	
3.3	Provide for user-friendly hazard data accessibility for mitigation and other planning efforts and for private citizens.				X	X	
4.1	Acquire and maintain detailed critical facilities and lifelines such that these sites can be prioritized and risk-assessed for possible mitigation actions.		X		X	X	X
4.2	Improve hazard data available to the county and participating communities for use in future planning efforts.				X	X	
4.3	Incorporate new state and FEMA guidance, rules and regulations into the HMP.					X	
4.4	Strengthen understanding of, and adaptation to, a changing climate.	X	X	X	X	X	X
5.1	Increase local government official awareness regarding mitigation planning, project identification and funding opportunities for mitigation.				X	X	X
5.2	Provide government officials and local practitioners with educational opportunities and information regarding best practices for hazard mitigation planning, project identification, and implementation.				X	X	
5.3	Improve capabilities, coordination, and opportunities at municipal and county levels to plan and implement hazard mitigation projects, programs, and activities.				X	X	X
5.4	Support increased participation in the National Flood Insurance Community Rating System.	X	X	X			
5.5	Support increased integration of municipal/county hazard mitigation planning and floodplain management with effective municipal/county zoning regulation, subdivision regulation, and comprehensive planning implementation.				X	X	
6.1	Ensure continuity of operations of essential county and municipal government services.	X	X				X

Obj. #	Objective Statement	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6
6.2	Increase resiliency by facilitating rapid disaster recovery.	X	X				X
6.3	Support and encourage the implementation of alternative energy sources.	X	X				X

6.6 MITIGATION STRATEGY DEVELOPMENT AND UPDATE

6.6.1 Review of 2015 HMP Mitigation Action Plan

To evaluate progress on local mitigation actions, the planning consultant met with each participant to discuss the status of the mitigation actions identified in the 2015 plan. For each action, jurisdictions were asked to provide the status of each action (*No Progress, In Progress, Ongoing Capability, Discontinue, or Completed*) and provide review comments on each. Jurisdictions were requested to quantify the extent of progress and provide reasons for the level of progress or why actions were being discontinued. Each jurisdictional annex in Section 9 (Jurisdictional Annexes) provides a table identifying the jurisdiction's prior mitigation strategy, the status of those actions and initiatives, and their disposition within their updated strategy.

Local mitigation actions identified as *Complete*, and those actions identified as *Discontinued*, were removed from the updated strategies. Local mitigation actions identified as an *Ongoing Capability* were incorporated into the capability assessment of each jurisdictional annex. Those actions identified as *No Progress* or *In Progress* that remain a priority for the jurisdiction, have been carried forward into the updated mitigation strategy.

At the October 2019 kickoff meetings and during subsequent local-level planning meetings (phone, email, in-person local support meetings), all participating jurisdictions were requested to identify mitigation activities completed, ongoing, and potential/proposed. As new potential mitigation actions, projects, or initiatives became evident during the plan update process, including as part of the risk assessment update and as identified through the public and stakeholder outreach process detailed in Section 2 (Planning Process), jurisdictions were made aware of these either through direct communication (local meetings, email, phone), at Steering and Planning Committee meetings, or via their draft jurisdictional annexes.

Throughout the planning process, jurisdictions worked with the planning consultant to assist with the development and update of their annex and include mitigation strategies, focusing on identifying well-defined, implementable projects with a careful consideration of benefits (risk reduction, losses avoided), costs, and possible funding sources (including mitigation grant programs).

6.6.2 Identification and Analysis of Mitigation Techniques

Concerted efforts were made to assure that the jurisdictions develop updated mitigation strategies that included activities and initiatives covering the range of mitigation action types described in recent FEMA planning guidance (FEMA *Local Mitigation Planning Handbook* March 2013), specifically:

- Local Plans and Regulations—These actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Projects—These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection—These are actions that minimize damage and losses and preserve or restore the functions of natural systems.
- Education and Awareness Programs—These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions could include participation in national programs, such as the National Flood Insurance Program and Community Rating System, StormReady (NOAA), and Firewise (NFPA) Communities.

6.6.3 2020 HMP Mitigation Action Plan

To help support the selection of an appropriate, risk-based mitigation strategy, each annex was updated to provide a summary of hazard vulnerabilities identified during the plan update process, either directly by local representatives or through review of available County and local plans and reports, and through the hazard profiling and vulnerability assessment process.

A mitigation strategy workshop was co-led by NJOEM-Mitigation Unit and the contracted planning consultant on February 20, 2020, for all participating jurisdictions to support the development of the updated mitigation strategy. To assist with the identification of implementable and action-oriented mitigation actions, a three-step process was followed for the 2020 HMP update: 1) Assemble a 'mitigation toolbox'; 2) Identify problem statements through 'mitigation brainstorming' and 3) Update the mitigation action plan. This section describes the process followed by the County and the jurisdictions to develop the 2020 updated mitigation action plan.

The concept of a 'mitigation toolbox' was introduced to the Planning Partnership at the January 2020 risk assessment meeting. A mitigation toolbox contains numerous resources available to the County and participating jurisdictions to assist with the development of an updated mitigation action plan. This toolbox was referred to throughout the 2020 HMP mitigation strategy update. All materials were made available to all participants to access and will continue to serve as a resource over the plan performance period. The toolbox contains, but is not limited, to the following and will be continuously added to over time:

- 2020 HMP goals and objectives
- 2015 HMP Mitigation Strategy
- Risk assessment results
- Capability assessment results
- Outcomes of the SWOO
- Mitigation Catalog
- Subject-matter expertise
- Stakeholder and public input (e.g., citizen survey and stakeholder survey results)
- Existing plans/policies/programs
- FEMA resources (e.g., Mitigation Ideas).

As discussed in Section 2 (Planning Process) and earlier in this section, the January 2020 risk assessment meeting and individual jurisdiction meetings were focused on understanding risk and capabilities and identify gaps in capabilities, challenges and opportunities. This provided context for the next steps in the update of the mitigation strategy and inform the Planning Partnership of the available resources in their 'toolbox.'

At the February 2020 Mitigation Strategy Workshop, the Planning Partnership identified and reviewed focused problem statements based on the impacts of hazards in the County. The results of the updated risk assessment, challenges and opportunities identified during the capability assessment update and SWOO sessions, and information gathered from the citizen survey were used to inform problem statement development. At the workshop, the Planning Partnership broke up into small groups and round-table discussions led both by NJOEM and the planning consultant so jurisdictions could understand each other's problem statements and share either what others have done to address the problem or help brainstorm what the best mitigation action is to address. Information gathered from the citizen and stakeholder surveys were shared with the Planning Partnership to further inform the updated mitigation strategy development.

As a result, problem statement worksheets were developed to detail the problems/challenges/gaps/identified vulnerabilities the jurisdiction faces, then mitigation alternatives evaluated to best reduce future risk and address the identified problem. These problem statements were intended to provide a detailed description of the problem area, including impacts to the jurisdiction, past damages, and loss of service. These problem statements helped form a bridge between the hazard risk assessment, which quantifies impacts to each community, with the development of achievable mitigation strategies.

A strong effort has been made to better focus local mitigation strategies to clearly defined, readily implementable projects and initiatives that meet the definition or characteristics of mitigation. Broadly defined mitigation actions were eliminated from the updated strategy unless accompanied by discrete actions, projects, or initiatives.

Certain continuous or ongoing strategies that represent programs that are fully integrated into the normal operational and administrative framework of the community have been identified within the capabilities section of each annex and removed from the updated mitigation strategy.

Jurisdictions included mitigation actions to address vulnerable critical facilities located within the floodplain. For those facilities, each jurisdiction was asked to identify the status of mitigation: already mitigated and how/to what flood level, reason for not mitigating (e.g. do not have the jurisdiction to mitigate), or the proposed mitigation number included in the proposed mitigation action table in each annex. It is recognized, however, that in the case of projects being funded through federal mitigation programs, the level of protection can be influenced by cost-effectiveness, as determined through a formal benefit-cost analysis. In the case of "self-funded" projects, jurisdiction discretion must be recognized. Further, the County and jurisdictions have limited authority over privately-owned critical facility owners regarding mitigation at any level of protection.

Throughout the course of the plan update process, additional regional and county-level mitigation actions were identified by the following processes:

- Review of the results and findings of the updated risk assessment.
- Review of available regional and county plans reports and studies;
- Direct input from county departments and other county and regional agencies
- Input received through the public and stakeholder outreach process.

6.7 MITIGATION BEST PRACTICES

Catalogs of hazard mitigation best practices were developed that present a broad range of alternatives to be considered for use in Passaic County, in compliance with 44 CFR Section 201.6(c)(3)(ii). One catalog was developed for each natural hazard of concern evaluated in this plan; referred to as the Mitigation Catalog (Appendix F). The catalogs present alternatives that are categorized in two ways:

- By whom would have responsibility for implementation:

  - Individuals – personal scale
  - Businesses – corporate scale
  - Government – government scale
- By what each of the alternatives would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Build local capacity to respond to or be prepared for the hazard

The alternatives presented include actions that will mitigate current risk from hazards and actions that will help reduce risk from changes in the impacts of these hazards resulting from climate change. Hazard mitigation actions recommended in this plan were selected from among the alternatives presented in the catalog, as well as other resources made available to all jurisdictions (i.e., FEMA's Mitigation Ideas). The catalog provides a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the planning partners to implement. Some of these actions may not be feasible based on the selection criteria identified for this plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk from natural hazards within the planning area. Actions in the catalog that are not included for the partnership's action plan were not selected for one or more of the following reasons:

- The action is not feasible
- The action is already being implemented
- There is an apparently more cost-effective alternative
- The action does not have public or political support.

6.8 MITIGATION STRATEGY EVALUATION AND PRIORITIZATION

Section 201.c.3.iii of 44 CFR requires an action plan describing how mitigation actions identified will be prioritized. The County and participating jurisdictions utilized a modified STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) mitigation action evaluation methodology based on a set of evaluation criteria suited to the purposes of hazard mitigation strategy evaluation. This method provides a systematic approach that considers the opportunities and constraints of implementing a specific mitigation action.

The Steering Committee applied an action evaluation methodology, which includes an expanded set of 14 criteria to include the consideration of cost-effectiveness, availability of funding, anticipated timeline, and if the action addresses multiple hazards. The 14 evaluation criteria used in the 2020 update process is the same used in the 2015 plan:

1. Life Safety—How effective will the action be at protecting lives and preventing injuries?
2. Property Protection—How significant will the action be at eliminating or reducing damage to structures and infrastructure?
3. Cost-Effectiveness—Are the costs to implement the project or initiative commensurate with the benefits achieved?
4. Technical—Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
5. Political—Is there overall public support for the mitigation action? Is there the political will to support it?
6. Legal—Does the jurisdiction have the authority to implement the action?
7. Fiscal—Can the project be funded under existing program budgets (i.e., is this initiative currently budgeted for)? Would it require a new budget authorization or funding from another source such as grants?

8. Environmental–What are the potential environmental impacts of the action? Will it comply with environmental regulations?
9. Social—Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
10. Administrative—Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it? Will outside help be necessary?
11. Multi-hazard—Does the action reduce the risk to multiple hazards?
12. Timeline—Can the action be completed in less than 5 years (within our planning horizon)?
13. Local Champion—Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?
14. Other Local Objectives—Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?

Specifically, for each mitigation action, the jurisdictions were asked to assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria, defined as follows:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Further, jurisdictions were asked to provide a summary of the rationale behind the numeric rankings assigned, as applicable. The numerical results were totaled to assist each jurisdiction in selecting mitigation actions for the updated plan.

As step one in the prioritization process, actions that had a numerical value between 0 and 4 were initially prioritized as *low*; actions with numerical values between 5 and 9 were initially categorized as *medium*; and actions with numerical values between 10 and 14 were initially categorized as *high*. As step two, jurisdictions were then asked to consider the benefits and costs, as well as the desired timeline for implementation and project completion timeline when finalizing each action's priority as *high/medium/low*. These attributes are included in the mitigation strategy table and for FEMA-eligible projects in the mitigation worksheets (Section 9 – Jurisdictional Annexes).

For the plan update there has been an effort to develop more clearly defined and action-oriented mitigation strategies. These local strategies include projects and initiatives that are seen by the community as the most effective approaches to advance their local mitigation goals and objectives within their capabilities. In addition, each jurisdiction was asked to develop problem statements. With this process, participating jurisdictions were able to develop action-oriented and achievable mitigation strategies.

6.9 BENEFIT/COST REVIEW

Section 201.6.c.3iii of 44 CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review applied in for the evaluation and prioritization of projects and initiatives in this plan update process was qualitative; that is, it does not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Assistance (HMA) grant programs. For all actions identified in the local strategies, jurisdictions have identified both the costs and benefits associated with project, action or initiative.

Costs are the total cost for the action or project, and could include administrative costs, construction costs (including engineering, design and permitting), and maintenance costs.

Benefits are the savings from losses avoided attributed to the implementation of the project, and could include life-safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When possible, jurisdictions were asked to identify the actual or estimated dollar costs and associated benefits. Often numerical costs and/or benefits were not identified and may be impossible to quantify. In this case, jurisdictions were asked to evaluate project cost-effectiveness using *high*, *medium*, and *low* ratings. Where estimates of costs and benefits were available, the ratings were defined as the following:

Low <= $10,000 Medium = $10,000 to $100,000 High >=$100,000

Where quantitative estimates of costs and/or benefits were not available, qualitative ratings using the following definitions were used:

Table 6-3 Qualitative Cost and Benefit Ratings

Costs	
High	Existing funding levels are not adequate to cover the costs of the proposed project, and implementation would require an increase in revenue through an alternative source (e.g., bonds, grants, and fee increases).
Medium	The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
Low	The project could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.
Benefits	
High	Project will have an immediate impact on the reduction of risk exposure to life and property.
Medium	Project will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.
Low	Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low) are considered cost-effective. For some of the Passaic County initiatives identified, the planning partnership might seek financial assistance under FEMA's HMA programs. These programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed when funding applications are prepared, using the FEMA benefit/cost analysis model process. The planning partnership is committed to implementing mitigation strategies with benefits that exceed costs. For projects not seeking financial assistance from grant programs that require this sort of analysis, the planning partnership reserves the right to define "benefits" according to parameters that meet its needs and the goals and objectives of this plan.

SECTION 7. PLAN MAINTENANCE

- In this update the maintenance process has been more clearly outlined to provide a roadmap for the annual monitoring of the plan. This includes a summary plan maintenance matrix that provides an overview of the planning partner responsibilities for monitoring, evaluation, and update of the plan.
- Specific discussion of ongoing or proposed integration actions including those to support incorporation of mitigation planning as an integral component of daily government operations is included in Section 5 (Capability Assessment) rather than summarized in this section of the plan,

This section details the formal process that will ensure that the HMP remains an active and relevant document and that the Planning Partnership maintains their eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every five years. In addition, this section describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this plan update will be incorporated into existing planning mechanisms and programs, such as comprehensive land use planning processes, capital improvement planning, and building code enforcement and implementation. The plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

The plan maintenance matrix shown in Table 7-1 provides a synopsis of responsibilities for plan monitoring, evaluation, and update, which are discussed in further detail in the sections below.

Table 7-1. Plan Maintenance Matrix

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission for Annual Progress Report.	August or upon major update to Master Plan or major disaster	Jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	Jurisdictional implementation lead identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)
Integration	In order for integration of mitigation principles action to become an organic part of the ongoing county and municipal activities, the county will incorporate the distribution of the safe growth worksheet (see 7.1.2 below) for annual review and update by all participating jurisdictions.	August each year with interim email reminders to address integration in county and municipal activities.	HMP Coordinator and jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	HMP Coordinator
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support to assess the effectiveness of the plan; compile and finalize the Annual Progress Report	Finalized progress report completed by October 14 of each year	Steering Committee; Plan Maintenance element	Jurisdictional points of contacts identified in Section 9 (Jurisdictional Annexes)

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Update	Reconvene the planning partners, at a minimum, every 5 years to guide a comprehensive update to review and revise the plan.	Every 5 years or upon major update to Master Plan or major disaster	Passaic County HMP Coordinator	Jurisdictional points of contacts identified in Section 9 (Jurisdictional Annexes)

7.1 MONITORING, EVALUATING AND UPDATING THE PLAN

The procedures for monitoring, evaluating, and updating the plan are provided below.

The HMP Coordinator is assigned to manage the maintenance and update of the plan during its performance period. The HMP Coordinator will chair the Steering Committee and be the prime point of contact for questions regarding the plan and its implementation as well as to coordinate incorporation of additional information into the plan.

The Planning Committee shall fulfill the monitoring, evaluation and updating responsibilities identified in this section which is comprised of a representative from each participating jurisdiction. Each jurisdiction is expected to maintain a representative on the Planning Committee throughout the plan performance period (five years from the date of plan adoption). As of the date of this plan, primary and secondary mitigation planning representatives (points-of-contact) are identified in each jurisdictional annex in Section 9 (Jurisdictional Annexes).

Regarding the composition of the committee, it is recognized that individual commitments change over time, and it shall be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation. The HMP Coordinator will strive to keep the committee makeup as a uniform representation of planning partners and stakeholders within the planning area.

Currently, the Passaic County HMP Coordinator is designated as:

Name: Robert A. Lyons
Email Address: pcoem@passaiccountynj.org

7.1.1 Monitoring

The Planning Committee shall be responsible for monitoring progress on, and evaluating the effectiveness of, the plan, and documenting annual progress. Each year, beginning one year after plan development, Passaic County and local Planning Partnership representatives will collect and process information from the departments, agencies and organizations involved in implementing mitigation projects or activities identified in their jurisdictional annexes (Section 9) of this plan, by contacting persons responsible for initiating and/or overseeing the mitigation projects.

In the first year of the performance period, this will be accomplished by utilizing an online performance progress reporting system, the BATool[SM] which will enable municipal and county representatives of directly access mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, add or delete projects to maintain mitigation project implementation. It is anticipated that all participating partners will be prompted by the tool to update progress annually, providing an incentive for participants to refresh their mitigation strategies and to continue implementation of projects. It is expected that this reporting system will support the submittal of an increased number of project grant fund applications due to the functionality of the system which facilitates the sorting and prioritization of projects.

In addition to progress on the implementation of mitigation actions, including efforts to obtain outside funding; and obstacles or impediments to implementation of actions, the information that Planning Partnership representatives shall be expected to document, as needed and appropriate include:

- Any grant applications filed on behalf of any of the participating jurisdictions
- Hazard events and losses occurring in their jurisdiction,
- Additional mitigation actions believed to be appropriate and feasible,
- Public and stakeholder input.

Plan monitoring for years 2 through 4 of the plan performance periods will be similarly addressed via the BATool[SM] or manually.

7.1.2 Integration Process of the HMP into Municipal Planning Mechanisms

As discussed in Section 5 (Capability Assessment), integrating hazard mitigation into a community's existing plans, policies, codes, and programs leads to development patterns designed to not increase risk from known hazards or to lead to redevelopment that reduces risk from known hazards. The Passaic County Planning Partnership was tasked with identifying how hazard mitigation is integrated into existing planning mechanisms. Refer to Section 9 (Jurisdictional Annexes) for how this is done for each participating municipality. During this process, many municipalities recognized the importance and benefits of incorporating hazard mitigation into future municipal planning and regulatory processes.

During the HMP annual review process, each participating municipality will be asked to document how they are utilizing and incorporating the Passaic County HMP into their day-to-day operations and planning and regulatory processes. Additionally, each municipality will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Report. The following checklist was adapted from FEMA's Local Mitigation Handbook (2013), Appendix A, Worksheet 4.2. This checklist will help a community analyze how hazard mitigation is integrated into local plans, ordinances, regulations, ordinances, and policies. By completing the checklist, it will help municipalities identify areas that integrate hazard mitigation currently and where to make improvements and reduce vulnerability to future development. In this manner, the integration of mitigation into municipal activities will evolve into an ongoing culture within the county and its municipalities.

Table 7-2. Safe Growth Check List

Planning Mechanisms	Do you Do This? Yes	No	Notes: How is it being done or how will this be utilized in the future?
Operating, Municipal and Capital Improvement Program Budgets			
• When constructing upcoming budgets, hazard mitigation actions will be funded as budget allows. Construction projects will be evaluated to see if they meet the hazard mitigation goals.			
• Annually, during adoption process, the municipality will review mitigation actions when allocating funding.			
• Do budgets limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?			
• Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?			
• Do budgets provide funding for hazard mitigation projects identified in the County HMP?			
Human Resource Manual			
• Do any job descriptions specifically include identifying and/or implementing mitigation projects/actions or other efforts to reduce natural hazard risk?			
Building and Zoning Ordinances			
• Prior to, zoning changes, or development permitting, the municipality will review the hazard mitigation plan and other hazard analyses to ensure consistent and compatible land use.			
• Does the zoning ordinance discourage development or redevelopment within natural areas including wetlands, floodways, and floodplains?			
• Does it contain natural overlay zones that set conditions			
• Does the ordinance require developers to take additional actions to mitigate natural hazard risk?			
• Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?			
• Do the ordinances prohibit development within, of filling of, wetlands, floodways, and floodplains?			
Subdivision Regulations			

Planning Mechanisms	Do you Do This? Yes	No	Notes: How is it being done or how will this be utilized in the future?
• Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?			
• Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?			
• Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?			
• Do the regulations allow density transfers where hazard areas exist?			
Master Plan			
• Are the goals and policies of the plan related to those of the County HMP?			
• Does the future land use map clearly identify natural hazard areas?			
• Do the land use policies discourage development or redevelopment with natural hazard areas?			
• Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?			
Land Use			
• Does the future land use map clearly identify natural hazard areas?			
• Do the land use policies discourage development or redevelopment with natural hazard areas?			
• Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?			
Transportation Plan			
• Does the transportation plan limit access to hazard areas?			
• Is transportation policy used to guide growth to safe locations?			
• Are transportation systems designed to function under disaster conditions (e.g. evacuation)?			
Environmental Management			
• Are environmental systems that protect development from hazards identified and mapped?			
• Do environmental policies maintain and restore protective ecosystems?			
• Do environmental policies provide incentives to development that is located outside protective ecosystems?			

Planning Mechanisms	Do you Do This? Yes	No	Notes: How is it being done or how will this be utilized in the future?
Grant Applications			
• Data and maps will be used as supporting documentation in grant applications.			
Municipal Ordinances			
• When updating municipal ordinances, hazard mitigation will be a priority			
Economic Development			
• Local economic development group will take into account information regarding identified hazard areas when assisting new businesses in finding a location.			
Public Education and Outreach			
• Does the municipality have any public outreach mechanisms / programs in place to inform citizens on natural hazards, risk, and ways to protect themselves during such events?			

7.1.3 Evaluating

The evaluation of the mitigation plan is an assessment of whether the planning process and actions have been effective, if the HMP goals are being achieved, and whether changes are needed. The HMP will be evaluated on an annual basis to determine the effectiveness of the programs, and to reflect changes that could affect mitigation priorities or available funding.

The status of the HMP will be discussed and documented at an annual plan review meeting of the Steering and Planning Committees (Planning Partnership), to be held either in person or via teleconference approximately one year from the date of local adoption of this update, and successively thereafter. At least two weeks before the annual plan review meeting, the Passaic County HMP Coordinator will advise the Planning Partnership of the meeting date, agenda and expectations of the members.

The Passaic County HMP Coordinator will be responsible for calling and coordinating the annual plan review meeting and soliciting input regarding progress toward meeting plan goals and objectives. These evaluations will assess whether:

- Goals and objectives address current and expected conditions.
- The nature or magnitude of the risks has changed.
- Current resources are appropriate for implementing the HMP and if different or additional resources are now available.
- Actions were cost effective.
- Schedules and budgets are feasible.
- Implementation problems, such as technical, political, legal or coordination issues with other agencies are presents.
- Outcomes have occurred as expected.
- Changes in county or municipal resources impacted plan implementation (e.g., funding, personnel, and equipment)
- New agencies/departments/staff should be included, including other local governments as defined under 44 CFR 201.6.

Specifically, the Planning Partnership will review the mitigation goals, objectives, and activities using performance-based indicators, including:

- New agencies/departments
- Project completion
- Under/overspending
- Achievement of the goals and objectives
- Resource allocation
- Timeframes
- Budgets
- Lead/support agency commitment
- Resources
- Feasibility

Finally, the Planning Partnership will evaluate how other programs and policies have conflicted or augmented planned or implemented measures, and shall identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions ("Implementation of Mitigation Plan through Existing Programs" subsection later in this section discusses this process). Other programs and policies can include those that address:

- Economic development
- Environmental preservation
- Historic preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use/zoning
- Public education and outreach
- Transportation

The Planning Partnership should refer to the evaluation forms, Worksheets #2 and #4 in the FEMA 386-4 guidance document, to assist in the evaluation process (see Appendix G – Plan Review Tools). Further, the Planning Partnership should refer to any process and plan review deliverables developed by the County or participating jurisdictions as a part of the plan review processes established for prior or existing local HMPs within the County.

The Passaic County HMP Coordinator shall be responsible for preparing an Annual HMP Progress Report for each year of the performance period, based on the information provided by the Planning Partnership, information presented at the annual meeting, and other information as appropriate and relevant. These annual reports will provide data for the five-year update of this HMP and will assist in pinpointing any implementation challenges. By monitoring the implementation of the HMP on an annual basis, the Planning Partnership will be able to assess which projects are completed, which are no longer feasible, and what projects should require additional funding.

The Annual HMP Progress Report shall be posted on the Passaic County OEM's Office website to keep the public apprised of the plan's implementation (https://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php). Additionally, the website provides details on the HMP update planning process. For communities who participate or might choose to join the NFIP CRS program, this report will also be provided to each CRS participating community in order to meet annual CRS recertification requirements. To meet this recertification timeline, the Planning partnership will strive to complete the review process and prepare an Annual HMP Progress Report by August of each year.

The HMP will also be evaluated and revised following any major disasters, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages or if data listed in the Section 4.3 of this plan has been collected to facilitate the risk assessment. This is an opportunity to increase the community's disaster resistance and build a better and stronger community.

7.1.4 Updating

44 CFR 201.6.d.3 requires that local hazard mitigation plans be reviewed, revised as appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA 2000. It is the intent of Passaic County to update this plan on a five-year cycle from the date of initial plan adoption.

To facilitate the update process, the Passaic County HMP Coordinator, with support of the Planning Partnership, shall use the second annual meeting to develop and commence the implementation of a detailed plan update program. The Passaic County HMP Coordinator shall invite representatives from NJOEM to this meeting to provide guidance on plan update procedures. This program shall, at a minimum, establish who shall be responsible for managing and completing the plan update effort, what needs to be included in the updated plan,

and a detailed timeline with milestones to assure that the update is completed according to regulatory requirements.

At this meeting, the Planning Partnership shall determine what resources will be needed to complete the update. The Passaic County HMP Coordinator shall be responsible for assuring that needed resources are secured.

Following each five-year update of the mitigation plan, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all planning group members and the New Jersey State Hazard Mitigation Officer.

7.1.5 Grant Monitoring and Coordination

Passaic County recognizes the importance of having an annual coordination period that helps each planning partner become aware of upcoming mitigation grant opportunities identifies multi-jurisdiction projects to pursue. Grant monitoring will be the responsibility of each municipal partner as part of their annual progress reporting. The Passaic County HMP Coordinator will keep the planning partners apprised of FEMA Hazard Mitigation Assistance grant openings and assist in developing letters of intent for grant opportunities when practicable.

Passaic County intends to be a resource to the planning partnership in the support of project grant writing and development. The degree of this support will depend on the level of assistance requested by the partnership during open windows for grant applications. As part of grant monitoring and coordination, Passaic County intends to provide the following:

- Notification to planning partners about impending grant opportunities.
- A current list of eligible, jurisdiction-specific projects for funding pursuit consideration.
- Notification about mitigation priorities for the fiscal year to assist the planning partners in the selection of appropriate projects.

Grant monitoring and coordination will be integrated into the annual progress report or as needed based on the availability of non-HMA or post-disaster funding opportunities.

7.2 IMPLEMENTATION OF MITIGATION PLAN THROUGH EXISTING PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those existing plans and programs.

Section 5 (Capability Assessment) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county and local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9 (Jurisdictional Annexes), the County and each participating jurisdiction identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("existing integration"), and how they intend to promote this integration ("opportunities for future integration").

As discussed in Section 5 (Capability Assessment), it is the intention of Planning Partnership representatives to continue to incorporate mitigation planning as an integral component of daily government operations. The Planning Partnership representatives will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further,

the sample adoption resolution (Appendix A) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Committee anticipates that:

1) Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts;
2) The Hazard Mitigation Plan, Master Plans, Emergency Management Plans and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of county residents.

Other planning processes and programs to be coordinated with the recommendations of the hazard mitigation plan include the following:

- Emergency operations and response plans
- Training and exercise of emergency response plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community Wildfire Protection Plans
- Comprehensive Flood Hazard Management Plans
- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

During the annual plan evaluation process, the Planning Partnership representatives will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Report.

7.3 CONTINUED PUBLIC INVOLVEMENT

Passaic County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This HMP update will continue to be posted on-line (https://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php).

In addition, public outreach and dissemination of the HMP will include:

- Links to the plan on municipal websites of each jurisdiction with capability.
- Continued utilization of existing social media outlets (Facebook, Twitter) to inform the public of natural hazard events, such as floods and severe storms. Educate the public via the jurisdictional websites on how these applications can be used in an emergency situation.

- Development of annual articles or workshops on flood hazards to educate the public and keep them aware of the dangers of flooding.

Planning Committee representatives and the Passaic County HMP Coordinator will be responsible for receiving, tracking, and filing public comments regarding this HMP. The public will have an opportunity to comment on the plan via the hazard mitigation website at any time. The HMP Coordinator will maintain this website, posting new information and maintaining an active link to collect public comments.

The public can also provide input at the annual review meeting for the HMP and during the next five-year plan update. The Passaic County HMP Coordinator is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the five-year plan update as appropriate. Additional meetings might also be held as deemed necessary by the planning group. The purpose of these meeting would be to provide the public an opportunity to express concerns, opinions, and ideas about the mitigation plan.

The Planning Committee representatives shall be responsible to assure that:

- Public comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.
- Copies of the latest approved plan (or draft in the case that the five-year update effort is underway) are available for review, along with instructions to facilitate public input and comment on the HMP.
- Appropriate links to the Passaic County Hazard Mitigation Plan website are included on municipal websites.
- Public notices are made as appropriate to inform the public of the availability of the plan, particularly during HMP update cycles.

The Passaic County HMP Coordinator shall be responsible to assure that:

- Public and stakeholder comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.
- The Passaic County HMP website is maintained and updated as appropriate.
- Copies of the latest approved plan are available for review at appropriate county facilities along with instructions to facilitate public input and comment on the plan.
- Public notices, including media releases, are made as appropriate to inform the public of the availability of the plan, particularly during plan update cycles.

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN 2020 UPDATE

Volume II

Prepared for:

Passaic County Office of Emergency Management
Robert A. Lyons, County Coordinator

Prepared by:
Tetra Tech, Inc.
6 Century Drive, Suite 300
Parsippany, NJ 07054

Photo Credit: Adobe Stock

Passaic County and All Municipalities
Hazard Mitigation Plan 2020 Update

Volume II

SEPTEMBER 2020

FEMA APPROVED PENDING ADOPTION – OCTOBER 23, 2020

Prepared for:

Passaic County Office of Emergency Management

Prepared by:

TETRA TECH

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6 Century Drive, Suite 300

Parsippany, NJ 07054

SECTION 8. PLANNING PARTNERSHIP

2020 HMP Changes

- The 2020 HMP update maintained the two-volume approach with each jurisdiction having an individual annex (Section 9). Enhancements to the annex subsections is described below and in further detail in this section.
  - Reorganization of information
  - Expanded capability assessment to include integration in the tables and a subsection on adaptive capacity
  - A streamlined presentation of the hazard ranking
  - The mitigation of repetitive and severe repetitive flood loss properties is listed
  - Problem statements are summarized in the updated mitigation strategy table
  - A subsection dedicated to staff and local stakeholder involvement in annex development

This section provides a description of the Passaic County's HMP update planning partnership, their responsibilities throughout the planning process, and the jurisdictional annexes developed as a result of their plan update efforts.

8.1 BACKGROUND

The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning for hazard mitigation. All participating jurisdictions must meet the requirements of Chapter 44 of the Code of Federal Regulations (44 CFR):

"Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan" [Section 201.6a(4)]

Members of the Planning Partnership have the expertise to develop the plan and have their jurisdiction's authority to implement the mitigation strategy developed during the planning process. The Planning Partnership is responsible for developing and reviewing draft sections of the plan, updating their respective annex, creating the mitigation strategy for their jurisdiction, and adopting the final plan.

For the Passaic County HMP update, a Planning Partnership was formed to leverage resources and to meet requirements for the federal Disaster Mitigation Action of 2000 (DMA) for as many eligible governments as possible. Members of the Planning Partnership consisted of representatives from each jurisdiction. The DMA defines a local government as follows:

Any county, municipality, city, town, township , public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Each participating planning partner has prepared a jurisdictional annex to this plan. These annexes, as well as information on the process by which they were created, are contained in this volume.

8.2 INITIAL SOLICITATION AND LETTERS OF INTENT

Passaic County solicited the participation of all municipalities in the County at the commencement of this project. All municipalities interested signed a "Letter of Intent to Participate" committing their participation and

resources to the development of the Passaic County HMP update (Appendix B). Passaic County and all municipalities in the County participated in the update process and have met the minimum requirements of participation as established by the County and Steering Committee.

8.3 PLANNING PARTNER EXPECTATIONS

The Steering Committee developed the following list of planning partner expectations, which were confirmed at the kick-off meeting held on August 15, 2019 (see Appendix C [Meeting Documentation] for details):

- Complete administrative tasks:
  - Complete a letter of intent to participate and return to the Passaic County OEM
  - Designate points of contact
- Provide representation at planning partnership meetings;
- Provide information about jurisdictional assets (critical facilities, plans/ordinances, hazard events/damages, new development, etc.) as requested;
- Support public outreach efforts within the jurisdictions, including posting of notices and plan links on websites and local media sources, advertising and supporting public meetings, and supporting outreach to NFIP repetitive loss and severe repetitive loss property owners, where applicable;
- Solicit and encourage the participation of regional agencies, a range of stakeholders, and citizens in the HMP development process;
- Assist with the identification of stakeholders within the jurisdiction that should be informed and potentially involved with the planning process;
- Prepare and submit a jurisdictional annex.
  - Attend mitigation workshop
  - Perform a capability assessment
  - Review the risk assessment
  - Involve local NFIP Floodplain Administrator in the planning process and have them complete the NFIP portion of the annex
  - Review the 2015 mitigation strategies and provide a status of each
  - Identify jurisdiction-specific mitigation strategies to address each of the natural hazards posing a risk to the jurisdiction;
- Review draft plan sections when requested and provide comment and input as appropriate;
- Ensure the HMP update meets the requirements of the DMA 2000, and FEMA and NJOEM guidance;
- Adopt the plan by resolution of local governing body after FEMA conditional approval;
- Provide information regarding progress on identified initiatives as requested by the County Hazard Mitigation Planning Coordinator; and
- Participate, as able, in additional opportunities:
  - Attend municipal support meetings
  - Participate in and advertise the public review and comment period prior to adoption.

By adopting this plan, each planning partner also agrees to the plan implementation and maintenance protocol established in Volume I. As described in Volume I, Section 7 (Plan Maintenance) it is intended that the planning partnership remain active beyond the regulatory update to support plan maintenance. Regarding the composition of the Steering Committee and Planning Partnership, it is recognized that individual commitments change over time, and it shall be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation.

8.4 JURISDICTIONAL ANNEX PREPARATION PROCESS

As in the 2015 HMP, the jurisdictional annexes were maintained and updated for the 2020 HMP. The jurisdictional annexes continue to provide a unique, stand-alone guide to mitigation planning for each jurisdiction.

Data Collection

Each jurisdiction was paired with a contract consultant mitigation planner to work with the primary POC, alternate POC, NFIP Floodplain Administrator and the mitigation team to update their annexes. Each jurisdiction was asked to participate in a municipal kick-off meeting, held on October 10, 2019 to review participant expectations and the updated information needed to support the annex update. It was made clear that the annexes are sections of the plan that can be enhanced if more information is available to further customize any and all aspects of mitigation planning.

A concerted effort was made to have all plan participants document areas of flooding outside of the floodplain. This information was captured at individual meetings held with the contract consultant; as well as displayed on poster-sized maps available at the January 23, 2020 risk assessment meeting for review and update.

Hazard Ranking Exercise

The presentation of the risk assessment and hazard ranking for each jurisdiction was conducted in January 2020. At this meeting, the consultant presented the overall risk assessment for the hazards of concern and distributed jurisdiction-specific handouts with risk assessment results relevant to each plan participant. In addition, each planning partner was asked to review the ranked hazards specific for its jurisdiction. Refer to Section 4.4 (Hazard Ranking) for the methodology of the hazard ranking process. The calculated ranking was presented to each jurisdiction and they were asked to review the ranking and revise based on history of events, probability of occurrence, and the potential impact on people, property, and the economy. In addition, each jurisdiction was asked to rank their adaptive capacity for each hazard. Refer to Appendix B (Participation Documentation) for the input submitted by each municipality. The objectives of this exercise were to familiarize the partnership with how to use the risk assessment as a tool to support other planning and hazard mitigation processes and to help prioritize types of mitigation actions that should be considered. Hazards that were ranked as "high" for each jurisdiction as a result of this exercise were considered to be priorities for identifying appropriate mitigation actions, although jurisdictions also identified actions to mitigate "medium" or "low" ranked hazards as appropriate.

Strengths Weaknesses Obstacles and Opportunities (SWOO) Exercise

After the draft risk assessment results were presented and hazard ranking exercise conducted, attendees at the January 2020 meeting participated in a facilitated SWOO session to identify strengths, weakness or challenges, obstacles and opportunities in hazard mitigation for the County's high-ranked hazards. Then, each jurisdiction was asked to complete a SWOO worksheet to document strengths, weaknesses, obstacles and opportunities relevant to their jurisdiction for their high-ranked hazards. All SWOO results were compiled and provided as a resource to plan participants at the Mitigation Strategy Workshop in February 2020. Refer to Appendix B (Participation Documentation) which provides the information captured by meeting participants during the SWOO session.

Mitigation Strategy Workshop

A mitigation strategy workshop was conducted by the contracted planning consultant on February 20, 2020, for all participating jurisdictions to support the development of the updated mitigation strategy. To assist with the identification of implementable and action-oriented mitigation actions, a three-step process was followed for the

2020 HMP update: 1) Assemble a 'mitigation toolbox'; 2) Identify problem statements through 'mitigation brainstorming' and 3) Update the mitigation action plan. The purpose of this workshop was to guide the planning partnership in completing this portion of the planning process and discuss how projects that are well developed and documented are more quickly identifiable for selection when grants become available.

At the workshop, the Planning Partnership focused on developing problem statements based on the impacts of hazards in the County and their communities. The results of the updated risk assessment, challenges and opportunities identified during the capability assessment update and SWOO sessions, and information gathered from the citizen survey were used to inform problem statement development. At the workshop, the Planning Partnership broke up into small groups and round-table discussions took place so municipalities could understand each other's problem statements and share either what others have done to address the problem or help brainstorm what the best mitigation action is to address.

As a result, problem statement worksheets were developed to detail the problems/challenges/gaps/identified vulnerabilities the jurisdiction faces, then mitigation alternatives evaluated to best reduce future risk and address the identified problem. These problem statements were intended to provide a detailed description of the problem area, including impacts to the jurisdiction, past damages, and loss of service. These problem statements helped form a bridge between the hazard risk assessment, which quantifies impacts to each community, with the development of achievable mitigation strategies.

Municipal Support Meetings

In addition to the municipal kick-off meeting, municipal support meetings were held throughout the planning process. At these support meetings, the consultant worked one-on-one with the planning partners to complete their jurisdictional annexes. Each section of the annex was discussed to ensure accuracy and completeness. This included, but not limited to, the following:

Exhibit 8-1. Participants Working at the Mitigation Strategy Workshop

- Reviewing the calculated hazard ranking for the jurisdiction and provide input to adjust the ranking as necessary.
- Inspecting the list of critical facilities located in the jurisdiction and their exposure to the 1% flood hazard area. For those critical facilities located in the Special Flood Hazard Area, each jurisdiction was requested to document whether the asset is already mitigated or identify an action to mitigate future flood impacts. By reviewing the list, jurisdictions were able to identify additional mitigation actions related to the critical facilities.
- Identify mitigation initiatives that have reasonable potential to be accomplished within the lifespan of the County HMP (five years), including both FEMA-eligible projects and those projects using funds from non-FEMA sources.

Jurisdictional Annexes

While the jurisdictional annex format is designed to document and assure local compliance with the DMA 2000 regulations, its greater purpose and function includes:

- Providing a locally relevant synthesis of the overall mitigation plan that can be readily presented, distributed, and maintained;
- Facilitating local understanding of the community's risk to natural hazards;
- Facilitating local understanding of the community's capabilities to manage natural hazard risk, including opportunities to improve those capabilities;
- Facilitating local understanding of the efforts the community has taken, and plans to take, to reduce their natural hazard risk;
- Facilitating the implementation of mitigation strategies, including the development of grant applications;
- Providing a framework by which the community can continue to capture relevant data and information for future plan updates.

It is recognized that each jurisdiction's annex is a "living" document and will continue to be improved as resources permit. As such, its design is intended to promote and accommodate continued efforts to maintain the annex to be current and to improve the effectiveness of the annex as the key tool, reference and guiding document by which the jurisdiction will implement hazard mitigation locally.

The following provides a description of the various elements of the jurisdictional annex.

Cover Page: A new addition to each annex is a dashboard that summarizes the jurisdiction. It does not summarize all risk assessment results; it only highlights a few hazards to provide an example of potential impacts. It also summarizes the 2020 mitigation action plan described in further detail in 9.X.7.

Section 9.X.1: Hazard Mitigation Planning Team: Identifies the hazard mitigation planning primary and alternate(s) contacts and Floodplain Administrators as identified by the jurisdiction.

Section 9.X.2: Jurisdiction Profile: Provides an overview and profile of the jurisdiction.

Section 9.X.3: Growth/Development Trends: Identifies of areas of known and anticipated future development and the vulnerability of those areas to the hazards of concern.

Section 9.X.4: Capability Assessment: This subsection provides an inventory and evaluation of the jurisdiction's tools, mechanisms and resources available to support hazard mitigation and natural hazard risk reduction. Within the municipal annexes, tables provide an inventory of the municipality's planning and regulatory, administrative and technical, and fiscal, capabilities, respectively. Further, another table identifies the municipality's level of participation in state and federal programs designed to promote and incentivize local risk reduction efforts. Further information regarding Federal, State and local capabilities may be found in the Capability Assessment portion of Section 5.

- ***Adaptive Capacity:*** *A new addition to the capability assessment is a summary of the jurisdiction's adaptive capacity to each hazard.*

- ***National Flood Insurance Program (NFIP):*** This subsection documents the NFIP as implemented within the jurisdiction. This summary was based on questions prepared by, and/or interviews conducted with, the NFIP Floodplain Administrators for each NFIP-participating community in the County. This subsection also identifies actions to enhance implementation and enforcement of the NFIP within the community.

- ***National Flood Insurance Program (NFIP) Summary:*** Provides NFIP summary statistics for the jurisdiction.

- ***Integration of Hazard Mitigation into Existing and Future Planning Mechanisms:*** This subsection identifies how the jurisdiction has integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities"), and/or how they intend to promote this integration ("integration actions"). This is included as a new column in the planning/regulatory table and described in narrative at the end of this subsection.

Section 9.X.5: Hazard Event History Specific to the Jurisdiction: Identifies hazard events that have caused significant impacts within the jurisdiction, including a summary characterization of those impacts as identified by the jurisdiction. The documentation of events and losses is critical to supporting the identification and justification of appropriate mitigation actions, including providing critical data for benefit-cost analysis. It is recognized that this "inventory" of events and losses is a work-in-progress, and may continue to be improved as resources permit. As such, the lack of data or information for a specific event does not necessarily mean that the jurisdiction did not suffer significant losses during that event.

Section 9.X.6: Jurisdiction-Specific Vulnerabilities and Hazard Ranking: This subsection provides information regarding each plan participant's vulnerability to the identified hazards. New to the 2020 HMP is a table summarizing the risk assessment results for the jurisdiction. Full data and information on the hazards of concern, the methodology used to develop the vulnerability assessments, and the results of those assessments that serve as the basis of these local risk rankings may be found in Section 4.

- ***Repetitive Flood Losses:*** A summary of the repetitive and severe repetitive loos properties in the jurisdiction is documented. In addition, the number of properties mitigated has also been documented as recorded by NJOEM.
- ***Critical Facility and Lifeline Flood Risk:*** Identifies potential flood losses to critical facilities in the jurisdiction, based on the flood vulnerability assessment process presented in Section 4 (Risk Assessment). If a mitigation action is identified, this is specified in the table.
- ***Identified Issues:*** Presents other specific hazard vulnerabilities as identified by the jurisdiction.
- ***Hazard Extent and Location:*** Each annex includes a map (or series of maps) illustrating identified hazard zones, critical facilities, and areas of NFIP Repetitive Loss/Severe Repetitive Loss (RL/SRL). Further, these maps show areas of known or anticipated future development, as available and provided by the jurisdiction. These maps may be found at the end of the annex.
- ***Hazard Risk Ranking***: The Passaic County HMP update identifies and characterizes the broad range of hazards that pose risk to the entire planning area; however, each jurisdiction has differing degrees of risk exposure and vulnerability aside from the whole. The local risk ranking serves to identify each jurisdiction's degree of risk to each hazard as it pertains to them, supporting the appropriate selection and prioritization of initiatives that will reduce the highest levels of risk for each community.

Section 9.X.7: Mitigation Strategy and Prioritization: This section discusses and provides the status of past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

- ***Past Mitigation Initiative Status:*** Where applicable, a review of progress on the jurisdiction's prior mitigation strategy is presented, identifying the disposition of each prior action, project or initiative in the jurisdiction's updated mitigation strategy. Other completed or on-going mitigation activities that were not specifically part of a prior local mitigation strategy may be included in this sub-section as well.
- ***Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy:*** Other completed or on-going mitigation activities that were not specifically part of a prior local mitigation strategy may be included in this subsection as well.

- ***Proposed Hazard Mitigation Initiatives for the Plan Update:*** Table 9.X-16 presents the jurisdiction's updated mitigation strategy. Table 9.X-17 provides a summary of the local mitigation strategy prioritization process discussed in Section 6 (Mitigation Strategy). Table 9.X-18 summarizes the mitigation action types identified by hazard in the jurisdiction.

Section 9.X.8: Staff and Local Stakeholder Involvement in Annex Development: A wide range of departments, stakeholders, and persons familiar with the jurisdiction should be involved in the development of the jurisdictional annexes. This section provides details on which departments were involved throughout the development of the jurisdictional annex. Further detail is provided in Section 2 (Planning Process), Section 9 (jurisdictional annexes) and Appendix B (Participation Matrix).

Action Worksheets: FEMA-eligible mitigation actions, projects and initiatives are further documented on an Action Worksheet which provides details on the project identification, evaluation, prioritization and implementation process.

Annex Review

Workshops and additional meetings (via in person, email and/or teleconference) to complete the jurisdictional annexes were held with the Steering and Planning Committees throughout the planning process. In preparation for the draft plan public review, each jurisdiction was asked to have their 'mitigation team' review their annex to ensure it was complete and accurate for posting to the Passaic County OEM's mitigation website. The signature page or emails documenting annex review are included in Appendix B.

In summary, all participating communities and the County completed the planning partner expectations and annex-preparation process. Details regarding these meetings are described further in Sections 2 (Planning Process) and 6 (Mitigation Strategy). Completed jurisdictional annexes are presented in Section 9.

8.5 COVERAGE UNDER THE PLAN

All jurisdictions (County and municipalities) met the participation requirements specified by the Steering Committee. Table 8-1 lists the status of each jurisdiction, whether or not they submitted letters of intent to participate, and their ultimate status in this plan update. Refer to Appendix B (Participation Documentation) and Appendix C (Meeting Documentation) for details on participation and meeting attendance.

Table 8-1. Jurisdictional Status

Jurisdiction	Letter of Intent to Participate	Attended Workshops and/or Meetings and Project Calls	Provided Update on Past Projects	Submitted Mitigation Actions for Current Plan	Seeking Approval for Adoption (meets all previous requirements)
Passaic County	NA	X	X	X	Yes
Bloomingdale, Borough of	X	X	X	X	Yes
Clifton, City of	X	X	X	X	Yes
Haledon, Borough of	X	X	X	X	Yes
Hawthorne, Borough of	X	X	X	X	Yes
Little Falls, Township of	X	X	X	X	Yes
North Haledon, Borough of	X	X	X	X	Yes
Passaic, City of	X	X	X	X	Yes
Paterson, City of	X	X	X	X	Yes

Jurisdiction	Letter of Intent to Participate	Attended Workshops and/or Meetings and Project Calls	Provided Update on Past Projects	Submitted Mitigation Actions for Current Plan	Seeking Approval for Adoption (meets all previous requirements)
Pompton Lakes, Borough of	X	X	X	X	Yes
Prospect Park, Borough of	X	X	X	X	Yes
Ringwood, Borough of	X	X	X	X	Yes
Totowa, Borough of	X	X	X	X	Yes
Wanaque, Borough of	X	X	X	X	Yes
Wayne, Township of	X	X	X	X	Yes
West Milford, Township of	X	X	X	X	Yes
Woodland Park, Borough of	X	X	X	X	Yes

NA = Not applicable. The Passaic County's OEM is the HMP Coordinator and managed the project and grant and served as Steering Committee chair. A letter of intent to participate was not required for Passaic County.

Workshops and additional meetings (via in person, email and/or teleconference) to complete the jurisdictional annexes were held with the Steering and Planning Committees throughout the planning process. In summary, all participating communities and the County completed the planning partner expectations and annex-preparation process. Details regarding these meetings are described further in Section 2 (Planning Process) and Section 6 (Mitigation Strategy). Completed jurisdictional annexes are presented in Section 9.

SECTION 9. JURISDICTIONAL ANNEXES

Section 201.6.a(4) of Chapter 44 of the Code of Federal Regulations (44CFR) states: "Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan." One component of each participating jurisdiction's involvement in the planning process of this HMP was to prepare an annex that focuses specifically on the natural hazards facing their community and the mitigation actions they propose to reduce their exposure and losses to these hazards.

Passaic County and each participating jurisdiction completed an annex that outlines the following information: natural hazard event history, hazard ranking and vulnerability, capabilities, progress on past mitigation actions and an updated mitigation strategy specific to the County or that jurisdiction. Once complete, the County and each participating jurisdiction reviewed and approved their final annex prior to submission to the NJOEM and the FEMA Region 2. Each jurisdiction's annex itself may be found in Sections 9.1 through 9.17.

9.1 PASSAIC COUNTY

This section presents the jurisdictional annex for Passaic County. The annex includes a general overview of Passaic County; an assessment of Passaic County's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.1.1 Hazard Mitigation Planning Team

The following individuals are Passaic County's identified HMP update primary and alternate points of contact.

Table 9.1-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Robert A. Lyons, County Coordinator Passaic County Office of Emergency Management 300 Oldham Road Wayne, NJ 07470 pcoem@passaiccountynj.org	Maryann Trommelen, Deputy County Coordinator Passaic County Office of Emergency Management 300 Oldham Road Wayne, NJ 07470 pcoem@passaiccountynj.org

9.1.2 Jurisdiction Profile

Section 3 (County Profile), Volume I of this HMP includes details on Passaic County's population, location, climate, history, and growth and development.

9.1.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. The jurisdictional annexes for each municipality summarize recent and expected future development trends, including major residential/commercial development and major infrastructure development. The Passaic County's Planning Board plays a vital role in reviewing building permit and site plan applications for proposed land development along County roads or which will cause stormwater to drain either directly or indirectly to a County road or through any drainage-way, structure, pipe, culvert or facility for which the County is responsible for the construction, maintenance or proper functioning.

9.1.4 Capability Assessment

An inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies was developed for the County. Section 5 (Capability Assessment) in Volume I of this plan describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.

- The County's adaptive capacity for the impacts of climate change.

Areas that mitigation is currently integrated are summarized in this Capability Assessment. Passaic County identified specific integration activities that will be incorporated into procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to Passaic County and where hazard mitigation has been integrated.

Table 9.1-2. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	No	State, Local	Yes	No	-
Comment: *NJAC 5:23-3, 14; enforced at the local level. The local municipality enforces the building code.*					
Zoning Code	No	Local	Yes	No	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Enforced at the local level.*					
Subdivisions	No	Local	Yes	No	-
Comment: *Site Plan and Subdivision Regulations pursuant to NJSA 40:27-6 et. seq. This is enforced at the local level. The County Planning Board must review any subdivisions of land within the County and approve subdivisions affecting county roads or drainage facilities.*					
Stormwater Management	No	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8)*					
Post-Disaster Recovery	Yes	County	-	Yes	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-		-	-
Comment:					
Shoreline Development	No	-	Yes; however, for coastal communities	-	-
Comment:					
Site Plan Review	Yes	County and Local	Yes	Yes	-
Comment: *The County Planning Board conducts site plan review for land development along county roads or areas affecting county drainage facilities. For these types of projects, the County Planning Board must approve for development. All other development, the site plan review process is done at the municipal level.*					
Environmental Protection	No	-	-	-	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.*					
Flood Damage Prevention	No	Local	Yes	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
***Comment**: Floodplain management enforced at the local level*					
Wellhead Protection	Yes	County but enforced at the local level	No	No	No
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Steep Slopes	No	-	-	-	-
Comment:					
Other					
Comment:					
Planning Documents					
Master Plan	Yes	County	Yes	Yes	-
Comment: Passaic County Master Plan Elements: • *Transportation Element* • *Corridor Enhancement Program* • *Green Stormwater Infrastructure Element* • *Highlands Element and Regional Master Plan* • *Parks, Recreation and Open Space Master Plan* • *Sustainability Element*					
Capital Improvement Plan	Yes	County	Yes	Yes	-
***Comment:** This is included in the county's budget each year and performed by the County Administration and Freeholders*					
Disaster Debris Management Plan	Yes	County	No	Yes	-
***Comment:** In progress for the County and all municipalities. County's HMP vulnerability assessment to obtain estimated debris produced during each storm.*					
Floodplain or Watershed Plan	Yes	County	No	-	-
Comment:					
Stormwater Management Plan	No	-	Yes – local level	-	-
***Comment:** Refer to the Green Infrastructure Element of the Passaic County Master Plan. At the municipal level, the County Planning Board reviews and approves stormwater management plans and ordinances.*					
Stormwater Pollution Prevention Plan	Yes	County - Engineering	-	-	-
***Comment:** Individual plans for county-owned facilities*					
Urban Water Management Plan	No	-	-	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Habitat Conservation Plan	Yes	County	No	-	-
Comment: *Highlands Commission; Natural Resource Management Guide*					
Economic Development Plan	Yes	Federal, County, Local	No	Yes	-
Comment: *Passaic County New Jersey Comprehensive Economic Development Strategy, 2015*					
Shoreline Management Plan		Local	No	No	-
Comment:					
Community Wildfire Protection Plan					
Comment:					
Community Forest Management Plan	Yes			Yes	2020-Passaic-007
Comment: *The Forest Management Plan has directed the County on how to proceed with staying ahead of the Emerald Ash Borer infestation of ash trees. The Forester is working to develop a tree inventory to help guide in the future on all hazard trees. See 2020-Passaic-007.*					
Transportation Plan	Yes	County	No	Yes	-
Comment: *Refer to the County Master Plan, Transportation Element, October 2012*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	County, Local	No	Yes	-
Comment: *Passaic County New Jersey Comprehensive Economic Development Strategy, 2015*					
Recreational and Open Space Inventory	No	-	No	-	-
Comment:					
Open Space Plan	Yes	County		Yes	
Comment: *Refer to the County Master Plan, Parks, Recreation and Open Space Master Plan Element, July 2014. The plan discusses floodprone areas and Green and Blue Acres funding used to mitigate floodprone properties. Map of floodplains.*					
Parks Master Plan					
Comment: *Refer to the County Master Plan, Parks, Recreation and Open Space Master Plan Element, July 2014*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	County & Local			
Comment: *Passaic County Office of Emergency Management, Emergency Operations Plan*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Emergency Response Plan	Yes	County and local	No	-	-
Comment: *Passaic County Office of Emergency Management, Emergency Operations Plan*					
Other	Yes				
Comment: *Passaic County Code Blue Alert Plan – ensures that at risk individuals are being protected from weather related exposure and possible death.*					

Table 9.1-3. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Planning Board reviews and approves all developments abutting County roads
Does your jurisdiction have the ability to track permits by hazard area?	No The Planning Board does not issue building permits. The Planning Board provides approvals which then allows applicants to apply for the appropriate permits. Building permits are a municipal responsibility and are issued (along with occupancy permits) only after the applicant receives County Planning Board approval when required. There are County permits that can be required which are obtained through the Passaic County Roads and/or Engineering department including road opening permits and right-of-way access permits. They also need approval to connect to the County stormwater system or encroach into County rights-of-way (Freeholder approval).
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to Passaic County.

Table 9.1-4. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Department of Planning
Mitigation Planning Committee	Yes	OEM – Mitigation Plan Lead
Environmental Board / Commission	No	
Open Space Trust Fund Advisory Committee	Yes	Department of Planning
Comprehensive Economic Development Strategy Committee (CEDS Committee)	Yes	Department of Planning and Economic Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911
Maintenance program to reduce risk	Yes	Engineering, Office of Emergency Management
Mutual aid agreements	Yes	Fire & Hazmat
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Department of Planning Department of Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Department of Engineering
Planners or engineers with an understanding of natural hazards	Yes	Department of Engineering
Staff with training in benefit/cost analysis	Yes	Department of Engineering
Staff with training in green infrastructure	Yes	Department of Engineering Department of Planning
Staff with education/knowledge/training in low impact development	Yes	Planning Board
Surveyor	No	Contracts out on per project basis, as needed
Stormwater engineer	Yes	Department of Engineering
Personnel skilled or trained in GIS applications	Yes	Department of Planning and Economic Development
Local or state water quality professional	No	Contract out on per project basis, as needed
Scientist familiar with natural hazards in local area	Yes	Department of Engineering
Emergency manager	Yes	Emergency Management Coordinator at OEM
Watershed planner	No	Contract out on per project basis, as needed
Environmental specialist	No	Contract out on per project basis, as needed
Grant writers	Yes	Consultant
Resilience Officer	No	
Other		

Fiscal Capability

The table below summarizes financial resources available to Passaic County.

Table 9.1-5. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No

Financial Resource	Accessible or Eligible to Use?
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes/No
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	

Education and Outreach Capability

The table below summarizes the education and outreach resources available to Passaic County.

Table 9.1-6. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes Office of Emergency Management has mitigation page, and Hurricane Survival Guide
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes Facebook and Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	County website
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Reverse 911 (Sheriff's Department)

Community Classifications

The table below summarizes the classifications for community programs available to Passaic County.

Table 9.1-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Not eligible	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Not applicable	-	-
Public Protection (Fire ISO Protection Class)	Not applicable	-	-
Storm Ready Certification	Not participating	-	-
Firewise Community Classification	Not participating	-	-
Sustainable Jersey	Not applicable	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is

often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the County's rating.

- Does the County have access to resources to determine the possible impacts of climate change upon the municipality? Yes
- Is the administrative supportive of integrating climate change in policies or actions? Yes
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the County? Yes

Table 9.1-8. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	High
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Low
Extreme Temperature	Medium
Flood	High
Geological Hazard	Medium
Hazardous Substances	Medium
Infestation and Invasive Species	Medium
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium

NATIONAL FLOOD INSURANCE PROGRAM

Management and regulation of the regulatory floodplains are done at the local level. Refer to the individual jurisdictional annexes for details on the NFIP for each municipality.

9.1.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the County made progress on integrating hazard mitigation into other initiatives. Additional accomplishments are listed below as completed and documented in the 2015 plan. The following plans and programs currently integrate components of the HMP and strategy:

Planning

Passaic County Green Stormwater Infrastructure Element (2019): The Green Stormwater Infrastructure Element is designed to enable the County to implement a comprehensive strategy for stormwater management

based on widespread application of Green Stormwater Infrastructure (GSI) and Low Impact Development (LID) strategies. Over the long term, it is intended to reduce flood-related damage and repetitive loss from localized flooding caused by smaller, more frequent storms; reduce the negative impacts from stormwater runoff to improve water quality; enable groundwater recharge, where feasible; and protect environmentally sensitive areas. The Element provides:

- Strategies to implement GSI/LID throughout the County
- Standardized technical guidance to support Countywide implementation on public capital improvement and private sector land development projects
- Recommendations to incorporate green stormwater infrastructure requirements into an update of the County's Site Plan and Subdivision Resolutions; and
- Resources for municipalities to facilitate the implementation at the local level.

The County Planning Board meets two times per month to review site applications that are on County roads, commercial, over 1-acre in size, and/or is a subdivision. The County reviews for traffic impacts and drainage. Green infrastructure is recommended at this stage.

***Five-Year Consolidated Plan/2013 Annual Action Plan (2013-17)*:** Flooding along the Passaic River and its tributaries has had a profound impact on the residential, commercial and industrial structure in Passaic County. This Plan helps to identify the housing needs and how to allocate funding from the Community Block Grant program and other sources to better improve the quality of life for its residents; due to flooding, the county has had a large increase in vacancy and severe repetitive loss properties. Overall, the Plan seeks to improve living standards for its residents, especially at need populations, improve or construct public facilities, improve the standards of public infrastructure, including water and sewer system improvements and roadway improvements, and to support vital public services for the elderly, homeless and special needs population.

Passaic County Transportation and Smart Growth Phase 1 Report (2005): The purposes of this Report were to address major safety and congestion issues on the County's roadways and promote a decrease in auto dependency. It also aimed to develop and implement a set of transportation modeling and simulation tools to assess future smart growth projects and transportation system. The Report details transportation growth should be used as a means to control County growth and land management. A decrease in auto dependency could provide alternate opportunities for infrastructure that would decrease stormwater runoff and help to mitigate the County's flood hazard.

In 2012, the County adopted a Transportation Element to its Master Plan that further established the ideas and concepts brought up in the Phase 1 Report. As the County grows, as will its transportation needs, which should be planned in a sustainable manner. The Element's main goals include to decrease auto dependency, integrate transportation into local land use plans to promote smart growth within each community and adopt policies and actions towards creating "Complete Streets." The following actions were proposed to meet these goals:

- Promote the principles of "Green Streets" as a means to limit the impact on the environment, primarily from flooding. Refer to Table 9.1-7 listing the mitigation strategy for the currently proposed projects to minimize flooding. A map is provided below.
- Develop a detailed Bicycle and Pedestrian Element to the County Master Plan
- Conduct vulnerability assessments of all mass transit services and facilities and roadways located in the Passaic River Basin
- Continue to seek solutions to the recurring drainage issues in the County

Sustainability Element of the Passaic County Master Plan (2013): This Element sets up a framework for the increased resiliency and sustainable growth of the County. It places climate change and greenhouse gas reduction as a top priority due to the projected increases in droughts and flooding events from more extreme and frequent rain events. Stormwater management is also placed as a top priority for the County due to the persistent flood risk. It identifies the importance of preserving and restoring environmentally sensitive resources and areas, while implementing sustainable methods of infrastructure growth and redevelopment. Integrating the numerous mitigation actions detailed in the Element will greatly mitigate the risk of various hazards, while also improving public health and increasing disaster preparedness.

The County has identified a new mitigation action to evaluate municipal and county zoning ordinances and master plans to reduce flooding (refer to their updated mitigation strategy in Table 9.1-7).

Parks, Recreation and Open Space Comprehensive Master Plan (2014): This Plan further establishes the goals and objectives in regarding to preserving and restoring the environment from the Sustainability Element. The Plan addresses a need to improve the quality of the County's open spaces and improve outreach and education to the residents about the importance of maintaining open space. It proposes to create connections between the Passaic County Park System and public schools to develop leadership, athletic and environmental activities. In addition to expanding the size of existing open space and acquiring new land, the County will seek to increase the resiliency and environmental quality of them as well, through methods including green infrastructure, integrated pest management and the use of native plant species.

GIS: As part of the 2015 County HMP update, a County-wide critical facility inventory was developed and used to assess risk. Refer to Section 5.4 (Risk Assessment) which details the results of the exposure and vulnerability assessments conducted as part of this HMP update. The Countywide critical facility inventory will be maintained and updated by the Department of Planning and Economic Development GIS analysts. This is a capability listed for the Department.

Engineering

When the Department of Engineering performs road work, they upgrade the stormwater infrastructure to meet the minimum standard of an 18-inch pipe, unless bigger is needed for the design. The Department has a contract on-call for drainage repair failures and upgrades are made that this time as well. In addition, when the roads are paved, the County puts in the grates and headers which redirect floatables and ensures compliance with NJDEP regulations. Refer to new mitigation action 2020-Passaic County-002 for a list of stormwater infrastructure improvements identified in the County.

Each year, the Department meets with NJDEP stormwater compliance officials to calculate debris collected from roads and how many inlets have changed.

Department of Health

The Passaic County Department of Health updated their website to provide information throughout the COVID-19 pandemic. This included general information, an informational dashboard regarding statistics, testing locations and relief.

The Passaic County carries out extensive efforts to remove blockages from Passaic County waterways and maintain drainage systems.

Mosquito Control is conducted regularly with information regarding pesticide information and spray schedule available on their website.

Public Education/Outreach Programs/Training

The County provides a great deal of information to its residents on the County website. The Office of Emergency Management aids residents in disaster preparedness and lists web links and documents to various preparedness guides and services. The Health Department also provides information on public health advisories and even has information regarding disaster preparedness from natural hazards and public health crises.

The Rutgers Cooperative Extension of Passaic County provides residents with educational opportunities and technical assistance on agricultural, environmental, social and economic issues. The Cooperative Extension plays a major role in youth development and education with the 4-H program.

The Sheriff's Department operates a reverse 9-1-1 system.

The County Health Department organizes regular health outreach events to raise awareness in the community of on-going and development threats to public health. Their website has a wealth of information regarding health resources; emergency preparedness; emergency response; COVID-19; influenza surveillance; Hazmat; and mosquito control.

Integration of Improved Hazard Information into Existing Emergency Management Plans

The County has funded multiple feasibility studies and vulnerability assessments, including the operation and potential removal of the Pompton and Pequannock dams. The Passaic River Basin Flood Advisory Commission publishes a periodic report on its recommendations for reducing flood risk along the Passaic River and its tributaries. Information from these documents is used during planning efforts and decision making at the county and municipal level.

A part of PCOEM's role is to conduct workshops with County OEM coordinators. Four workshops are held each year. This is considered an ongoing capability (Emergency Management Agency Assistance). PCOEM will continue to provide outreach on mitigation at OEM coordinator meetings.

CRS Initiative

In September 2014, the Passaic County Board of Chosen Freeholders adopted a resolution to provide assistance to municipalities that participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS). The County has a web page dedicated to CRS with resources available at: http://www.passaiccountynj.org/index.aspx?NID=1041. The goals of the Passaic County Community Rating System Program are to:

- Encourage municipal participation in the CRS;
- Increase the number of towns participating in the CRS program that may not have the technical capability, personnel or financial capacity to do so without program support;
- Leverage efficiencies of scale that result in a cost effective, shared service by providing towns with baseline data, information, and mapping services;
- Increase the number of buildings and structures covered in the CRS program;
- Lower cost for NFIP policy holders (residents and business owners) in special flood hazard areas;
- Promote mitigation preparedness and activities in special flood hazard areas;
- Assist towns in the preparation of their floodplain management plans and ordinances

- Provide peer support and access to professional assistance from County, state, and federal agencies through the User Group.

Funding

Open Space and Farmland Preservation Trust Fund: Each year, Passaic County opens up grant funding requests from the Open Space and Farmland Preservation Trust Fund. Any of Passaic County's 16 municipalities and qualified charitable conservancies are eligible to submit applications to the Open Space Trust Fund Advisory Committee. Preserving open space and conserving natural resources ensure a sustainable quality of life in Passaic County. Acknowledging the need to preserve open space and farmland and improve the park system / facilities in Passaic County, two referenda were added to the November 1996 Election Ballot concurrently as non-binding ballots. The citizens approved an Open Space and Farmland Preservation Trust Fund referendum and an Open Space and Parks Improvement referendum, which were ultimately consolidated as a result of legislative initiative.

PCOEM and the Department of Planning and Economic Development will continue to discuss FEMA hazard mitigation grant programs (and other federal grant programs such as CDBG) at the LEPC meeting conducted bi-annually and County OEM coordinator meetings conducted quarterly; distribute emails as opportunities are available through the State and FEMA and offer training as needed.

Engineering

When the Department of Engineering replaces bridge/culverts, sheet piles are installed to prevent scour as part of their standard procedures (unless footing is on rock).

For County-owned dams, Emergency Action Plans (EAPs) are updated by the Department of Engineering as required by NJDEP (5 county-owned dams). This is considered sensitive information and does not appear in the HMP update. This is an ongoing capability/technical requirement following dam safety regulations and appears as part of the County capability assessment. EAPs are submitted to the State and County.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the County will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- Refer to 2020-Passaic County-009 regarding updating the Passaic County Site Plan and Subdivision Resolution with the Green Stormwater Infrastructure Master Plan Element.
- Refer to 2020-Passaic County-010 regarding developing a password-protected web map to display the County's asset inventory to include roads, bridges and associated status and needs.

9.1.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Volume I, Section 4 (Risk Assessment) of this plan.

9.1.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following summarizes the hazards of greatest concern and risk to the County. For additional vulnerability information relevant to this jurisdiction, refer to Section 4 (Risk Assessment).

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the County. These properties are not owned by the County; therefore, the County has no jurisdiction to mitigate however supports local mitigation projects to address repetitive flooding. Refer to Section 4.3.7 (Flood) for more detailed information on NFIP statistics by municipality, and the municipal annexes in Sections 9.2 through 9.17 for details on the number of mitigated properties in each municipality.

- Number of repetitive loss (RL) properties: 988
- Number of severe repetitive loss (SRL) properties: 782

**As of April 2019 throughout all Passaic County municipalities. Refer to Table 4.3.7-12 for additional details on NFIP statistics in Passaic County.*

Critical Facilities

The table below identifies critical facilities in the County located in the 1-percent and 0.2-percent floodplain.

Table 9.1-9. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
There are no County-owned critical facilities in the floodplain.				

Additional Identified Vulnerabilities

The County has identified the following vulnerabilities within their community:

- The following County buildings need back-up power to ensure continuity of operations. Refer to mitigation action 2020-Passaic County-003
  - 495 River Street - Procurement, Paterson
  - 77 Hamilton Street, Paterson
  - 63 Hamilton Street – Courthouse Annex, Paterson
  - 930 Riverview Drive, Totowa

Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the County that illustrate the probable areas impacted. These maps are based on the best available data at the time of the preparation of this plan and are considered to be adequate for planning purposes (Section 4.3).

Hazard Ranking

The hazard ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential hazards across Passaic County. The Steering Committee and Planning Committee reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the County. During the review of the hazard ranking, the calculated rankings were adjusted to incorporate the perceived adaptive capacity with respect to the relevant hazard.

During the review of the hazard ranking, the Steering Committee agreed that flood should be a high-ranked hazard. It was noted as a medium-ranked hazard in 2015; however, flood impacts continue to be high and with the addition of climate change the Steering Committee agreed high is the best ranking to reflect risk across the County.

Table 9.1-10. Passaic County Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Medium	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Medium	Medium	Medium	Medium	Medium	Low

9.1.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under 'Capability Assessment' presented previously in this annex.

Table 9.1-11. Status of Previous HMP Mitigation Actions

2015 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
PC-1	Debris removal on roads and adjacent to structures such as bridges, culverts and dams.	Passaic County or	It is considered a capability; this action will be removed and		

	2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
		local municipalities	included in integration. The Department of Engineering conducts debris maintenance and responds during emergencies. However, the County does not have a completed Debris Management Plan – this is in progress (2020-Passaic County-001).		
PC-2	Develop Business Continuity Module/Disaster SOP for Passaic County Businesses	Passaic County	Complete. The Business Continuity Module/Disaster SOP for Passaic County businesses was developed in 2015 with the CEDS.		
PC-3	Evaluate municipal and county zoning ordinances and master plans to reduce flooding	Passaic County	The review needs to be in partnership with the municipalities as the ordinances are strictly local prevue and review would need to be done with clear coordination and outcomes. The Planning Department considers this a capability and service they can provide the municipalities so this will be removed as an action. The Planning Department has provided guidance in the Passaic County Green Stormwater Infrastructure Element to the Master Plan that municipalities can all include in ordinances to promote green infrastructure.		
PC-4	Support the mitigation of vulnerable structures to protect from future damage including property Acquisition for residential and commercial properties experiencing Repetitive and Severe Repetitive Flooding	Passaic County or local municipalities	Complete. A significant number of properties were acquired and demolished utilizing 2013 CDBG-DR funding. Properties acquired and demolished were located in Paterson, Wayne, Little Falls, Totowa, Hawthorne, Pompton Lakes and Woodland Park		
PC-5	Purchase of 7-acre site owned by VMC Group, 113 Main Street, Bloomingdale, NJ to Reduce Flooding along Main Street, Bloomingdale, NJ	Passaic County or Borough of Bloomingdale, NJ	No progress. This property was not acquired due to environmental contamination and lack of funding. Discontinue.		

2015 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
PC-6	Upgrade of Storm Water and Sewer Capacity of County roadways in all municipalities	Passaic County Engineering or local municipalities	When the County performs roadwork, the stormwater infrastructure is upgraded to meet the minimum standard of an 18-inch pipe, unless bigger is needed for the design. The County has identified three high priority locations at this time.	Yes	2020-Passaic County-002
PC-7	Provide Spatial Data/Services such as: Obtain more accurate, precise data by getting a copy of ArcScene and/or getting LIDAR to be able to create accurate inundation flood mapping. Maintain a countywide spatial layer for the repetitive loss and severe repetitive loss properties in the County. Maintain the critical facility inventory developed for this HMP update.	Passaic County Department of Planning/GIS	The Department of Planning maintains the spatial data for the County and this is considered a capability the County can provide as maps and inventories are requested. The County does have a layer of dams included in the asset management/inventory. An asset management/inventory is being planned for the County.		
PC-8	Implement recommendations in the Green Stormwater Infrastructure Plan in Paterson and Little Falls	Planning and Engineering	Complete. Passaic County has developed a Green Stormwater Infrastructure element to the Master Plan through a grant from the North Jersey Transportation Planning Authority The Element outlines a comprehensive strategy for stormwater management based on widespread application of low impact development and green stormwater infrastructure. It provides guidance to municipalities on how to incorporate green infrastructure into ordinances.		
PC-9	Planting and maintenance of healthy trees and vegetation throughout Passaic County and along County rights-of-way.	Planning and Engineering	Complete. Since 2015 the Department of Parks and Recreation has planted well over 300 trees throughout County parks. Many were planted by the State as part of the Route		

2015 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
			46/Route 3 project requirements.		
PC-10	Prepare plan to address stormwater events to prevent and/or alleviate flooding	Passaic County Planning & Economic Development	The County has performed 550 storm drain inlet retrofits/replacements Countywide between 2015 and 2019. <u>Street Sweeping</u> A. 2015 – 3,538 Miles that collected 1,165 cy of debris B. 2016 – 3,454 miles that collected 721 cy of debris C. 2017 – 2,597 miles that collected 926 cy of debris D. 2018 – 2,069 miles that collected 683 cy of debris E. 2019 – 2,916 miles that collected 910 cy of debris <u>Cleaning out Inlets</u> A. 2015 – 630 inlets that removed 363 cy of debris B. 2016 – 890 inlets that removed 427 cy of debris C. 2017 – 669 inlets that removed 168 cy of debris D. 2018 – 826 inlets that removed 228 cy of debris E. 2019 – 692 inlets that removed 249 cy of debris		
PC-11	Implement plan to restore County-owned park along Peckman River	Passaic County Planning & Economic Development	Status to be provided		
PC-12	Identify and implement non-structural innovative methods of holding back stormwater during events	Passaic County Planning & Economic Development	Complete. During Planning Board review, any new development the stormwater cannot go into the system, so they are required to build detention basins/seepage pits. This is being addressed as part of the Planning Board Ordinance update which is proposed as a new action 2020-Passaic County-009.	Yes	2020-Passaic County-009

	2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
PC-13	Conduct terrain visualization and analysis	Passaic County Planning & Economic Development	The Department of Planning and Economic Development is uncertain what this project is and this is not something that is prioritized as needed. This action is removed from the plan.		
PC-14	Implement Green Street Stormwater Mitigation design and construction	Planning and Engineering	Complete. Passaic County has developed a Green Stormwater Infrastructure element to the Master Plan through a grant from the North Jersey Transportation Planning Authority. The Element outlines a comprehensive strategy for stormwater management based on widespread application of low impact development and green stormwater infrastructure.	Yes	2020-Passaic County-009
PC-15	Implement outreach on mitigation. Discuss FEMA hazard mitigation grant programs at the annual OEM coordinator meetings; distribute emails as opportunities are available through the State and FEMA and offer training as needed.	PCOEM	This is considered a capability. PCOEM provides grant funding updates as they become available through FEMA and the State. Announcements are also made regarding available training at quarterly municipal coordinator meetings.		
PC-16	Provide Individual Technical Assistance and Direct Training Program for Business Community to develop individual Business Continuity Plans	Economic Development	Complete. The Division of Economic Development has been working with the WPUSBDC to provide technical assistance to companies to develop Business Continuity Plans. This is considered a capability and will be removed from the mitigation strategy.		
PC-17	Develop an emergency Grant Program for companies impacted by disasters	Economic Development	In progress. The COVID-19 pandemic has prompted the US Congress to provide funds to the NJEDA to develop a grant program for companies who have been impacted by COVID-19.	Yes	2020-Passaic County-007
PC-18	Subscribe to Co-Star and real estate listing services to identify alternative locations after a disaster	Economic Development	Complete. The Division of Economic Development does subscribe to Co-Star to		

	2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
			identify real estate for companies.		
19	Staff Technical Assistance Program for companies following disasters to brief them on financing, alternative real estate, job training grants/options, contacts with local utilities, etc.	Economic Development	Complete. The Division of Economic Development provides direct technical assistance to companies following disasters including financing; alternative real estate locations, job training programs and assistance with zoning approvals. This is considered a capability and being removed from the Mitigation Strategy.		
PC-20	Integrate hazard mitigation priorities into Capital Improvement Plans, transportation planning, and other capital planning.	Planning and Engineering.	Engineering includes design measures per NJDEP standards when conducting capital projects. This is considered a capability and removed: 1. Bridges – installs scour protection 2. Repairs inlets 3. Updates drainage where possible		
PC-21	Enhance County support of the Community Rating System (CRS). Create a County/Regional PPI, participate in at least 3 community outreach events.	Planning	Passaic County Department of Planning continues to coordinate with any municipality that requests assistance with participating in the CRS program. The Department has worked with the City of Paterson but they must have the necessary elements required to be eligible for the program. This is considered a capability and is removed from the action plan		
PC-22	Obtain backup power at critical facilities to ensure continuity of operations. The following locations have been identified to date: • Tower • EOC • Jail • Preakness Healthcare (backup shelter) • Alternate EOC • County-owned gas pump stations Administration Facility	OEM	The installation of permanent generators is in progress or has been completed for the following locations. Refer to new action 2020-Passaic County-003 for additional critical facilities and lifelines that need backup power. 1. Gas facility at golf course (FEMA HMA grant) 2. Jail (FEMA HMA grant) – under construction		2020-Passaic County-003

2015 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update? Check if Yes	Include in the 2020 HMP Update? Enter 2020 HMP Action #
			3. Communications Tower – NJTransit paid for the tower and this is diesel power 4. EOC – generator installed/paid by the Community College 5. Alternate EOC is the Police Academy (County purchased several years ago) 6. County owned-gas stations 7. Preakness Healthcare – shelter senior citizens in the past 8. Administration Facility 9. Sheriff's Department		
PC-23	Protect the exiting substructures (footings) of the County's culverts and bridges, against scour and flood conditions.	County Engineering Department	The County installs scour protection when working on bridges. The County conducted a scour countermeasure project for 10 County structures (NJDOT has a scour critical list of bridges, and 13 on the list last year, at end of 2020 there will be 1). Funded through NJDOT and the County.		

In addition to the above progress, Passaic County identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- When the County performs roadwork, the stormwater infrastructure is upgraded to meet the minimum standard of an 18-inch pipe, unless bigger is needed for the design.
- During Planning Board review, any new development the stormwater cannot go into the system, so they are required to build detention basins/seepage pits.
- A draft Green Stormwater Infrastructure Element has been developed as part of the Master Plan.
- The County performed Haledon Avenue Green Streets green infrastructure project in Paterson utilizing NJDEP 319h grant ($495,251).
- Passaic County was part of the NJTPA Passaic River Basin Climate Resilience Planning Study and integrated the data into this HMP risk assessment, and considered the study recommendations to reduce transportation vulnerability to heat and flood events.
- The Department of Engineering includes design measures per NJDEP standards when conducting capital projects (i.e., when working on bridges scour protection is installed).
- The County installs scour protection when working on bridges. The County conducted a scour countermeasure project for 10 County structures (NJDOT has a scour critical list of bridges, and 13 on the list last year, at end of 2020 there will be one remaining). This work is funded through NJDOT and the County.
- The County Engineering Department has performed approximately 550 drain inlet retrofits/replacements countywide between 2015 and 2019.

- The County Engineering Department has completed stormwater infrastructure upgrades at the following locations:
  - Broad Street, Clifton
  - East Main Street and Francisco Avenue, Little Falls
  - Margaret King Road, Ringwood
  - Greenwood Lake Turnpike, West Milford
- The County Department of Parks and Recreation have removed over 200 ash trees and continue to treat about 30 in an attempt to save them from Emerald Ash Borer.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

Passaic County participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. Passaic County participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.1-12 summarizes the comprehensive-range of specific mitigation initiatives Passaic County would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.1-12. Proposed Hazard Mitigation Initiatives and Associated Priority

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Passaic County-001	Countywide Debris Management Plan	**Problem:** The County does not have a countywide debris management plan with staging areas. **Solution:** Passaic County OEM will develop a countywide debris management plan, in coordination with NJDEP. OEM will work with all municipalities to identify staging areas and NJDEP will assist with determining if proposed staging areas are located in the floodplain.	N/A	Flood, Coastal Storm, Severe Weather, Severe Winter Storm	3, 5, 6	Passaic County OEM; NJDEP	State, County	High	Medium	Short	High	LPR	PR
2020-Passaic County-002	Stormwater Infrastructure Upgrades	**Problem:** The storm sewer system requires an increase in capacity along County roadways; locations may be in all municipalities. Currently there are three high priority locations identified in need of this work to alleviate flooding. **Solution:** Install new storm sewer systems, consisting of reinforced concrete pipe, inlets, manholes and slope stabilization to eliminate existing ponding, localized flooding and slope erosion along the below listed project limits. The work includes final restorations including replacement of sidewalk impacted by the work, asphalt restorations, and topsoiling and seeding of disturbed areas. Valley Road, Wayne – Location between Little Pond Road and Rose Terrace Jackson Avenue, Wayne – Location between Harmony Lane and a point 600' westerly Passaic Ave, Passaic – Location Terhune Avenue to Pleasant Avenue	Existing	Flood, Coastal Storm, Severe Weather	1, 2	Passaic County Engineer	County	High	High	Short	High	SIP	PP
2020-Passaic County – 003	Ensure continuity of operations at critical facilities	**Problem:** There is no backup power available at County assets that are also considered critical facilities and community lifelines.	Existing	Flood, Coastal Storm,	1, 2, 6	Passaic County OEM	County, FEMA HMA	High	High	Short	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
(former PC-22)	and lifelines by ensuring there is backup power	**Solution:** Install a permanent generator at the following facilities: • County Jail • 495 River Street - Procurement, Paterson • 77 Hamilton Street, Paterson • 63 Hamilton Street – Courthouse Annex, Paterson • 930 Riverview Drive, Totowa		Severe Weather									
2020-Passaic County - 004	Inventory of dam maintenance and deficiency status	**Problem:** The County has 49 high hazard dams. Their ownership and status of maintenance and deficiencies is not known at the County to assist with identifying projects and conducting outreach to owners. **Solution:** Request status of all dams from NJDEP and develop an outreach program to all dam owners with identified deficiencies and discuss next steps to bring to compliance, funding sources, etc.	Both	Dam Failure	4, 5	Department of Engineering	County	High	Low	Short	High	LPR	PR
2020-Passaic County - 005	Evacuation Routes	**Problem:** Coastal Storm is a high-ranked hazard at the County. The County needs updated evacuation routes mapped and accessible to residents in the event of evacuation. **Solution:** The Office of Emergency Management will coordinate with State Police and State Department of Transportation to identify and map evacuation routes in the County. These routes will be accessible via online through the State's ArcGIS Online system.	Not applicable	Coastal Storm	1, 2	Office of Emergency Management	State	High	Low	Short	High	EAP	PI
2020-Passaic County – 006 (former PC-6)	Tree Inventory	**Problem:** There is no countywide tree inventory to guide the Department of Parks and Recreation on infested trees. **Solution:** Develop an inventory of trees in the County and identify the trees that are hazards, such as ash trees susceptible to Emerald Ash Borer and other infestations/invasive species.	Not applicable	Infestation and Invasive Species	1, 2	Department of Parks and Recreation	State, County	High	Medium	Short	High	NSP	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Passaic County – 007 (former PC-17)	Pandemic Preparedness	**Problem:** The COVID-19 pandemic has put a tremendous strain on local and county resource with insufficient supplies and training. **Solution:** Passaic County needs additional supplies/equipment and storage facility space to stockpile to prepare for a pandemic. In addition, a hot wash is needed to gather lessons learned and gaps/needs from the current pandemic and implement training to prepare for the next event.	Not applicable	Disease Outbreak	1, 6	Department of Health	Federal, State	High	High	Short	Medium	LPR	PR
2020-Passaic County - 008		**Problem:** The COVID-19 pandemic has impacted businesses and the local economy. **Solution:** The COVID-19 pandemic has prompted the US Congress to provide funds to the NJEDA to develop a grant program for companies who have been impacted by COVID-19. The Division of Economic Development is currently assessing how they can assist businesses in the County recover. This action is in the early stages of development and will continue to be updated.	Existing	Disease Outbreak	All	Division of Economic Development	NJEDA	High	High	Long	High,	LPR	PR
2020-Passaic County – 009 (former PC-12)	County Site Plan and Subdivision Ordinance Update	**Problem:** The requirements of Green Stormwater Infrastructure within the County Site Plan and Subdivision resolution are not included. **Solution:** Adopt an update to the County's Site Plan and Subdivision Resolutions to incorporate Low Impact Development/Green Stormwater Infrastructure.	Both	Flood, Coastal Storm, Severe Weather	All	Department of Planning and Economic Development	County	High	Low	Short	High	LPR	PR
2020-Passaic County - 010	Establish an Enterprise GIS system to manage assets/maintenance/mitigation needs	**Problem:** There is no spatial platform to track asset inventories and their associated status and needs for maintenance and mitigation. An inter-department system is needed to support web mapping. **Solution:** Passaic County Department of Planning will develop an Enterprise GIS system which will allow for departments to store and are live data services and support web mapping products. This	Both	All	All	Department of Planning and Economic Development, County Engineer	County	High	Medium	Short	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		would be a password-protected system to display the County's asset inventory to include but not limited to roads, bridges and associated status and needs.											
2020-Passaic County - 011	Green Stormwater Infrastructure Implementation Plan	**Problem**: Passaic County does not have a countywide green stormwater infrastructure implementation plan as identified as a follow-up item in the Green Stormwater Infrastructure Master Plan Element. **Solution**: Develop a green stormwater infrastructure implementation plan to prioritize actions and identify funding opportunities and mechanisms to implement green stormwater infrastructure in the County.	Both	Coastal Storm, Flood, Severe Storm	All	Department of Planning and Economic Development	New Jersey Highlands Council, County	High	High	Short	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*

- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.1-13. Summary of Action Evaluation and Priority

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Passaic County - 001	Countywide Debris Management Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County - 002	Stormwater Infrastructure Upgrades	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County - 003	Ensure continuity of operations at critical facilities and lifelines by ensuring there is backup power	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Passaic County - 004	Inventory of dam maintenance and deficiency status	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County - 005	Evacuation Routes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County - 006	Tree Inventory	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County – 007	Assist Local Businesses	0	0	1	1	1	1	0	0	1	1	0	0	1	1	8	High
2020-Passaic County – 008	Pandemic supplies and training	1	0	1	1	1	1	0	0	1	1	0	1	1	1	10	Medium
2020-Passaic	County Site Plan and Subdivision Ordinance Update	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
County – 009																	
2020-Passaic County – 010	Establish an Enterprise GIS system	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic County – 011	Green Stormwater Infrastructure Implementation Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.1-14. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Capacity Building
Coastal Storm	-001, -009, -011	-002			-005	-002, -003	-009, -011	-010, -011
Dam Failure	-001, -004	-002, -004			-004	-003		-004, -010
Disease Outbreak	-007, -008		-007, -008		-007	-003		-007, -008, -010
Drought	-001					-003		-010
Earthquake						-003		-010
Extreme Temperature	-001				-005	-003		-010
Flood	-001, -009, -011	-002			-005	-002, -003	-009, -011	-010, -011
Geological Hazard	-001				-005	-003		-010
Hazardous Substances	-001				-005	-003		-010
Infestation and Invasive Species	-001, -006			-006				-006, -010
Severe Weather	-001, -009, -011	-002			-005	-002, -003	-009, -011	-010, -011
Severe Winter Weather	-001				-005	-003		-010
Wildfire	-001				-005	-003		-010

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.1.9 Staff and Local Stakeholder Involvement in Annex Development

Passaic County followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.1-15. Contributors to the Annex

Name	Entity	Method of Participation
Robert Lyons	PC OEM Coordinator	HMP Coordinator; attended meetings; contributed to and reviewed the annex
Maryann Trommelen	PC OEM Deputy Coordinator	Member of Steering Committee; attended meetings; reviewed progress of 2015 actions; identified capabilities; identified new actions; reviewed annex; assisted with outreach
Maria Dombayci	PC OEM Deputy Coordinator	Member of Steering Committee; attended meetings; reviewed progress of 2015 actions; identified capabilities; identified new actions; reviewed annex; assisted with outreach
Jonathan Pera	County Engineer, Department of Engineering	Member of Steering Committee; attended meetings; reviewed progress of 2015 actions; identified capabilities; identified new actions; reviewed annex; assisted with outreach

Name	Entity	Method of Participation
Deborah Hoffman	Department of Planning and Economic Development	Reviewed progress of 2015 actions; identified capabilities; identified new actions; reviewed annex; assisted with outreach
Mike Lysicatos	Director of Planning, Department of Planning and Economic Development	Member of Steering Committee; reviewed progress of 2015 actions; identified capabilities; identified new actions; reviewed annex
Darryl Sparta	Department of Parks	Member of Steering Committee; reviewed progress of 2015 actions; identified capabilities; identified new actions
Charlene Gungil	Department of Health	Reviewed progress of 2015 actions; identified capabilities; identified new actions

PC = Passaic County

9.2 BOROUGH OF BLOOMINGDALE

This section presents the jurisdictional annex for the Borough of Bloomingdale. The annex includes a general overview of the Borough; an assessment of the Borough of Bloomingdale's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.2.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Bloomingdale's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.2-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Jonathan Dunleavy / Mayor Address: 101 Hamburg Turnpike, Bloomingdale NJ Phone Number: 973-838-0778 ext 243 Email: jdunleavy@bloomingdalenj.net	Name / Title: Mike Hudson / OEM Coordinator Address: 101 Hamburg Turnpike, Bloomingdale NJ Phone Number: 973-838-0778 Email: oem@bloomingdalenj.net
NFIP Floodplain Administrator	
Name / Title: Thomas Boorady / Engineer Address: 86 Newark Pompton Turnpike, Riverdale, NJ 07457 Phone Number: 973-835-8300 Email: tab@darmofalski.com	

9.2.2 Jurisdiction Profile

The Borough of Bloomingdale was incorporated as an independent municipality when Pompton Township was divided into the Boroughs of Bloomingdale, Wanaque and Ringwood in 1918 (Snyder, 1969). The Borough of Bloomingdale is governed by a mayor and borough council, comprising of six council members.

According to the U.S. Census Bureau, the Borough has a total land area of 9.2 square miles, of which 8.7 square miles is land and 0.45 square miles is water. The Borough is located in the New Jersey Highlands, with land area in both the Preservation and Planning Areas.

According to the U.S. Census, the 2010 population for the Borough of Bloomingdale was 7,656. The estimated 2018 population was 8,072, a six-percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.7 percent of the population is 5 years of age or younger and 16.1 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.2.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. As noted above, the Borough has land in the Highlands Preservation and Planning Areas. In the Preservation Area, the DEP's Highlands Water Protection and Planning Act Rules (Rules), N.J.A.C. 7:38-1 et seq., establish the environmental standards and procedures by which the Department reviews any application pursuant to the Highlands Act. Some activities and projects, however, may be exempt. All "major Highlands development," as

defined by the Highlands Act, in the Preservation Area is regulated and will require DEP approval, unless otherwise exempted by the Act. This section summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development.

Bloomingdale's Main Street is in an Existing Community Zone in the Highlands Planning Area of the Highlands Regional Master Plan land use framework. The Borough conducted a preliminary investigation in 2018 to determine whether or not parcels in the borough qualified as an Area in Need of Redevelopment pursuant to provisions of the Local Redevelopment Housing Law (NJSA 40A:12A-1 et seq.) Areas of the Borough have been identified for redevelopment (103 parcels): Main Street and Van Dam Avenue Study Areas. The Main Street runs along the Pequannock River and the Borough acknowledged that this area faces wetland and flooding challenges and special investment and attention will be needed to address these conditions. The Borough received a Sustainable Economic Redevelopment Planning Grant from the Highlands Council to stimulate economic growth to revitalize Main Street and create a 'sense of place.'

Figures 9.2-2 and 9.2-3 at the end of this annex illustrate the geographically delineated hazard areas and the location of potential new development and the mentioned redevelopment areas identified.

Table 9.2-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	-	-	-	-	-
Multi-Family	-	1	1	-	3
Other (commercial, mixed-use, etc.)	2	3	3	2	1
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Recent development included replacing existing sewer lines					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Apartment complex	Affordable housing	Estimated 500 units	Behind the Public Works building at 188 Union Avenue	none	In negotiation

** Only location-specific hazard zones or vulnerabilities identified.*

9.2.4 Capability Assessment

The Borough of Bloomingdale performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.

- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in the Capability Assessment. The Borough of Bloomingdale identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Bloomingdale.

Table 9.2-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes		
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019.*					
Zoning Code	Yes	Local	Yes	Yes	
Comment*: State permissive on local level. [note local ordinance # and date of adoption]. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* *Zoning Chapter 92 amended through December 2018. The Borough has an application checklist with required documentation to submit that would identify anything would require mitigation. The engineer reviews the checklist. Once the checklist is complete, it goes to the Planning Board for review.*					
Subdivisions	Yes	Local	Yes	Yes	
Comment: *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Planning Board is the same as the Zoning Board. Borough has an application checklist with required documentation to submit that would identify anything would require mitigation. The engineer reviews the checklist. Once the checklist is complete, it goes to the Planning Board for review.*					
Stormwater Management	Yes	Local DPW	Yes		
Comment: *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* *Currently implementing new NJDEP changes. Certified in stormwater management and reviewing problem areas and outflows. Ordinance No 1-2020, adopted January 2020 addresses new requirements in the Borough's Tier A Municipal Stormwater General Permit; Chapter 31 (Drainage and Stormwater Management) discusses the stormwater flood hazard standards and associated development; Chapter XXXIA (Stormwater Control Requirements) discusses flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques to be explored before relying on structural Best Management Practices.* *The Borough's Stormwater Control Ordinance will be revised by March 2021 to comply with NJDEP's amended rules.*					
Post-Disaster Recovery	No				
Comment:					
Real Estate Disclosure	No				

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No				
Comment: *State Mandated on a municipal level. See Zoning Ordinance. Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* *The Borough has a town center designation since 2004 and is in the process of renewing with the State of NJ; this controls growth into a center format and prevents sprawl.* *Borough received a $75K grant from the Highlands (Highlands Environmental and Economics Sustainability grant) to help with the Town Center Designation to build in the Highlands); working with NJ Future on this. The grant and Borough funding are being used.* *Declared downtown as an area of economic redevelopment to entice development; however, downtown is in the floodplain. NJ Future helping with navigating the planning process and flood hazard to ensure developed to current standards.* *Main Street redevelopment study is part of this process; grant to zone it properly; obtained planners to help with next steps.*					
Site Plan Review	Yes	Local Planning Board	Yes		
Comment*: Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by county planning board and for the approval of those subdivisions affecting county road or drainage facilities. 40:27-6.10: Each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map.* *Ordinance No 3-2017, Chapter 69 Site Plan Review and Subdivision of Land - There is an ordinance review committee that reviews site plans to ensure in accordance with the current code before goes to the Local Planning Board.*					
Environmental Protection	Yes			Yes	
Comment*: The rules that are utilized by the NJ Department of Environmental Protection and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Chapter XXXIV (Environmental Impact Statement) permits the Borough to assess the impact of a proposed project upon the environment, particularly land, water, air, solid wastes, aquatic and terrestrial wildlife, social and economic life and aesthetics. As part of this, an EIS requires a copy of the flood map and wetlands delineation map.*					
Flood Damage Prevention	Yes	Federal, State, Local			
Comment: *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance.* *Ordinance No 6-2020; recently updated the flood damage prevention ordinance; February 5, 2020. Chapter XXX (Flood Hazard Protection); the local Construction Official is appointed to administer and implement this chapter including permit review, use of base flood and floodway data, maintenance of information and interpretation of the FIRM boundaries. New construction and substantial improvement freeboard is 2 feet above the base flood elevation.*					
Wellhead Protection	No				
Comment*: Delineation of well head protection areas (WHPAs) is part of the NJ-approved 1991 well head protection plan (WHPP) for public community water supply wells. These are priority areas for efforts to prevent and clean up ground water contamination. Municipalities are empowered to regulate land use, physical facilities and other activities within WHPAs areas, the potential for groundwater contamination can be reduced under the provisions of the New Jersey Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., which authorizes each municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents. Also refer to Safe Drinking Water Regulations (NJAC 7:10-11.7(b)1)).* *No wellheads serving the residents; have private wells on lake community*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Emergency Management	No				
***Comment**: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. See Emergency Operations Plans below. LEPC is in place.*					
Climate Change	No				
***Comment:** On the horizon - implementing in the Master Plan that future developments require electric charging stations for car; Environmental Commission; participate in Sustainable NJ*					
Disaster Recovery Ordinance	No				
Comment:					
Disaster Reconstruction Ordinance	No				
Comment:					
Other	No				
Comment: Chapter XXXII (Soil and Soil Removal) – discusses steep slopes and potential danger of flooding Chapter XXXV (Hazardous Materials) for emergency response, reimbursement and replacement of expended resources and nonreusable equipment in the case of a release of threatened release of any hazardous materials.					
Planning Documents					
Comprehensive / Master Plan	Yes, 2004	Local, Plan Board			
Comment: Chapter 92 *Per NJSA: Yes, if planning board (40:55D-28) and must be re-examined every ten years (40:55D-89.1); County: Yes (40:27-2)* *Redevelopment Plan for downtown* *Now in planning process to recommend ordinances in place to implement the plan*					
Capital Improvement Plan	Yes 2018	Local, Governing Board		Yes	
***Comment:** Per NJSA 40:55D-29) the governing body is authorized to direct the planning board to prepare a CIP with at least a six-year planning horizon. Updated in 2018; utility lines, stormwater; recently took advantage of loans from NJDEP and replaced 5 streets of water lines ($800K); focus on infrastructure due to age including stormwater; $100K for stormwater issues with outflows needing attention; stream and wetland restoration focus.*					
Disaster Debris Management Plan	Yes	DPW			
***Comment:** Lease area to a vendor who makes mulch/top-soil; Shared services in place with other towns to accept their debris; residents get free soil; sites are identified to store*					
Floodplain or Watershed Plan	Yes				
***Comment:** Wanaque Reservoir has a plan; In November 2019, the Borough updated their annex to the 2015 plan which serves as the Borough's Floodplain Management Plan under the Community Rating System Activity 510.*					
Stormwater Management Plan	Yes, 2013; Draft Oct 2019	Local, Engineer and DPW			
***Comment:** Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).* *Past December 2019 to satisfy MS4 permit, Borough is doing what the State requires. NJDEP reviewed the draft plan and stormwater best management practices. This is still in draft format.* *Developed a full digital mapping of drinking water, sewer and stormwater infrastructure and maintain these layers/maps with maintenance – so digitized infrastructure. Digitized outfalls to the river as well – self funded.* *NJDEP Is mandating green infrastructure be included in new redevelopment plan for stormwater.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Stormwater Pollution Prevention Plan	Yes, Oct 2019	Engineer and DPW			
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).* *There is a public outreach and education component as discussed in the Integration section later in this annex. This includes creating signage for the parks regarding washing your car; pet waste; that impacts what goes into stormwater.*					
Urban Water Management Plan	No				
Comment:					
Habitat Conservation Plan	No				
Comment*: May develop a conservation plan element in master plan per NJSA 40:5D-28b (8). When there is an application that impacts sensitive habitats, the Borough follows State requirements.*					
Economic Development Plan	Yes	Local, Governing Body			
Comment: Economic Development Plan and Board to identify economic dev sites. *Per NJSA 40:55D-28b. (9) There can be a generic Economic Development Element of the County Comprehensive Plan. Municipality can establish Economic Development Commission that can facilitate incentive programs (façade programs, low-interest loans, etc.). Bloomingdale's Main Street is in an Existing Community Zone in the Highlands Planning Area of the Highlands Regional Master Plan land use framework. The Borough conducted a preliminary investigation in 2018 to determine whether or not parcels in the borough qualified as an Area in Need of Redevelopment pursuant to provisions of the Local Redevelopment Housing Law (NJSA 40A:12A-1 et seq.) Areas of the Borough have been identified for redevelopment (103 parcels): Main Street and Van Dam Avenue Study Areas. The Main Street runs along the Pequannock River and the Borough acknowledged that this area faces wetland and flooding challenges and special investment and attention will be needed to address these conditions. The Borough received a Sustainable Economic Redevelopment Planning Grant from the Highlands Council to stimulate economic growth to revitalize Main Street and create a 'sense of place.'*					
Shoreline Management Plan	No				
Comment:					
Community Wildfire Protection Plan	No				
Comment: No separate plan with the Borough; State Park would have plan					
Community Forest Management Plan	No				
Comment: *Optional accreditation for county and municipalities for reduction of liability, New Jersey Urban and Community Forestry Program (NJUCF). Half Borough is State Forest so under State.*					
Transportation Plan	No				
Comment: *Part of the NJ Future and downtown planning will develop*					
Agriculture Plan	No				
Comment:					
Climate Action Plan	No				
Comment*:*					
Tourism Plan	No				
Comment: *In 2018, the County announced the start of a Tourism office. The County working on a tourism plan and Borough will leverage; mapping; signage*					
Business Development Plan	No				

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Part of the planning work underway will incorporate this with the Economic Commission*					
Other	Yes				
Comment: • *Open Space Plan, Yes, 2010, Local Environmental – Zoning officer enforces* • *Natural Resource Inventory, Yes 2004, Local Plan Board, Chapter 92*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes, Dec 2019	County, OEM			
Comment*: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No				
Comment: *Part of the EOP has information regarding hazards and risk assessment*					
Post-Disaster Recovery Plan	Yes				
Comment: *Refer to the EOP*					
Continuity of Operations Plan	Yes				
Comment: *Refer to the EOP*					
Public Health Plan	Yes				
Comment: *Refer to the EOP Health annex*					
Other					
Comment: *Participated in the County E-Team training; initiate an incident so the County is alerted of what is being managed at the local level*					

Table 9.2-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes; Roadrunner software ties to the zoning and could pull out permits in the floodplain
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes; less than 10 parcels because are located in Highlands State Forest Borough is built-out or large parcel already identified for future development

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Bloomingdale.

Table 9.2-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Autonomous
Mitigation Planning Committee	No	
Environmental Board / Commission	Yes	Mayor -council
Open Space Board / Committee	Yes	Mayor-council
Economic Development Commission / Committee	Yes	Mayor Council
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911 and outdoor warning
Maintenance program to reduce risk	Yes	Maintains stormwater basins; pre-storms part of DPW operations; walks through brooks to clean
Mutual aid agreements	Yes	Mayor Council
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer and Planning Board
Engineers or professionals trained in building or infrastructure construction practices	Yes	Construction Department
Planners or engineers with an understanding of natural hazards	Yes	Hired Professional
Staff with training in benefit/cost analysis	Yes	Finance
Staff with training in green infrastructure	Yes	Engineering firm
Staff with education/knowledge/training in low impact development	Yes	Construction Department/ Planning Board
Surveyor	Yes	Contractors as needed
Stormwater engineer	Yes	Engineer
Personnel skilled or trained in GIS applications	No	
Local or state water quality professional	Yes	Use Passaic Valley Water; Testing conducted annually Water Department
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	OEM
Watershed planner	Yes	Engineering firm
Environmental specialist	Yes	Engineering firm
Grant writers	Yes	Employees write on behalf of their departments
Resilience Officer	No	
Other		

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Bloomingdale.

Table 9.2-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Bloomingdale.

Table 9.2-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Police Department, Borough Clerk
Do you have personnel skilled or trained in website development?	Yes (Consultant)
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes Links to FEMA, NJOEM
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes Facebook, Municipal Website
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes Planning Board/OEM
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes Reverse911, Municipal Website, Warning Sirens
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Outdoor warning siren and Reverse 911

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Bloomingdale.

Table 9.2-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	8	
Building Code Effectiveness Grading Schedule (BCEGS)	Yes		
Public Protection (Fire ISO Protection Class)	Yes		
Storm Ready Certification	No		

Program	Participating?	Classification	Date Classified
Firewise Community Classification	No		
Sustainable New Jersey	Yes	Bronze	

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for climate change and the jurisdiction's rating to adapt to all-natural hazard events.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms (*hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)*	Medium
Dam Failure	Low – limited resources
Drought	Medium
Earthquake	Low – limited resources
Extreme Temperature	Medium
Flood (*riverine / flash flood, SLR*)	Medium
Geological Hazards (*landslides and subsidence/sinkholes*)	Medium
Severe Weather (*high wind, tornado, thunderstorm, and hail*)	High – alerts, and resources available
Severe Winter Weather (*heavy snow, blizzards, and ice storms*)	High
Wildfire	Medium
Hazardous Materials	Medium
Disease Outbreak (*WNV, Lyme, RMSF, Human Ehrlichiosis, flu, Enterovirus D68, Hep C, foodborne, ebola, measles, MRSA*)	Medium

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.2-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering

Criterion	Response
Who is your floodplain administrator? (name, department/position)	Thomas Boorady, CFM / Engineering
Are any certified floodplain managers on staff in your jurisdiction?	Yes, the NFIP Floodplain Administrator, Thomas Boorady, CFM
What is the date that your flood damage prevention ordinance was last amended?	February 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Exceeds - Substantial Improvement Definition includes cumulative over 10-yrs provision - Bloomingdale's freeboard requirement is the highest recommended by NJDEP's model ordinance - The recently adopted ordinance which received approval by both FEMA and NJDEP and recognizes the newly effect FIRMs (April 2020)
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 2015
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
□ If so, what type of assistance/training is needed?	
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	Yes, class 8
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	55 policies $15,703,900
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	83 losses (NFIP and Write Your Own) Total paid: $1,174,092 (NFIP and WYO)
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	Yes

**According to FEMA statistics as of July 31, 2019 (https://www.fema.gov/policy-claim-statistics-flood-insurance)*

WYO = Write Your Own

ADDITIONAL AREAS OF EXISTING INTEGRATION

- **Open Space Master Plan (2013):** The Borough's OSMP aims to protect open space and critical environmental resources, including wetlands, floodplains, steep slopes and stream corridors, while creating more open space and greenways to further these goals. The Plan addresses various hazards including the dangers of building within the floodplains, as well as disturbing and building upon steep slopes. The Borough looks to adopt environmental protection ordinances for stream buffers and recharge areas to protect water resources.

- In November 2000, the Borough enacted the Recreation and Open Space Establishment Municipal Trust Fund to aid in the preservation of historical sites and open space. These following actions are related to the use of the ROSE Fund:
    - Submit the OSMP to NJDEP Green Acres Planning Incentive Grant Program for matching acquisition funds of the ROSE fund
    - Examine opportunities to develop a greenway corridor project along the Pequannock River with surrounding communities
    - Implement the "Vision Plan for Bloomingdale" (adopted June 2006) by prioritizing the creation of a river walk along the Borough's Main Street
    - The Borough will utilize the HMP as a guide during the next Master Plan update. Refer to Table 9.2-16, new mitigation action 2020-Bloomingdale –05.

- **Stormwater Pollution Prevention Plan (2019):**
    - Outlines education and outreach program – described further below
    - The Borough has a stormwater facility maintenance program to ensure that stormwater facilities operated by the Borough function property; inspected annually. In high risk areas preventative maintenance will be performed (catch basins, swales, storm drains, detention ponds).
    - Planning and Zoning Boards ensure compliance before issuing preliminary or final subdivisions or site plan approvals under the Municipal Land Use Law; ensure that all new major development and redevelopment projects that are subject to Residential Site Improvement Standards and Borough Stormwater Control Requirements for stormwater management include NJDEP Stormwater Management rules and are in compliance with those standards.
    - The Borough has an annual catch basin cleaning program to maintain catch basin function and efficiency; inspections once per year. No catch basins and storm drains were identified with recurring problems at the time of the draft plan in 2019.
    - All municipally-owned storm drain inlets have been retrofitted.
    - Privately owned storm drain inlets are required to be retrofitted per Borough Code (31-13) if the owner is repairing, repairing, resurfacing, reconstructing or altering the surface in direct contact with the storm drain inlet. The Construction Official and/or Borough Engineer is responsible for enforcement of the retrofits.
    - The Borough has a digital MS4 outfall pipe map and provided to NJDEP. All outfall pipes are checked when inspections are made for illicit connections; records are maintained by the Director of Public Works.

- **Stormwater Management and Control**
    - Plan (2006): This Plan was adopted as a means to reduce the impacts on public health and the infrastructure by flooding caused by stormwater runoff, as well as increased soil erosion and nonpoint source pollution. Actions that will be used to achieve these goals include:
        - Adoption of a Stormwater Control Ordinance
        - Promote implementation of Low-Impact Development
        - Allow for mitigation plans where compliance to the standards and requirements of the Stormwater Management Plan cannot be reasonably met on-site
    - Chapter XXXIA (Stormwater Control Requirements) discusses flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques to be explored before relying on structural Best Management Practices for major development. This aligns with the County's Green Stormwater Infrastructure Element to their Master Plan.

- **Ordinances:** The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of Bloomingdale website at http://www.bloomingdalenj.net/index.cfm for further information.

- **Outreach:** The Borough's website has a link to the Swift-911 Notification system, which will contact residents for severe weather warnings and other hazards. The website also has an Announcement Board that holds information on current events and public health and safety advisories. This includes the following:
  - Stormwater outreach
  - Flood insurance and mapping information
  - COVID-19 pandemic information
  - Mosquito control

  The Borough library maintains flood protection materials for residents and visitors.

  The Stormwater Pollution Prevention Plan outlines the Borough's outreach and public education regarding stormwater. An annual distribution of DEP's brochure and educational materials is distributed to residents.

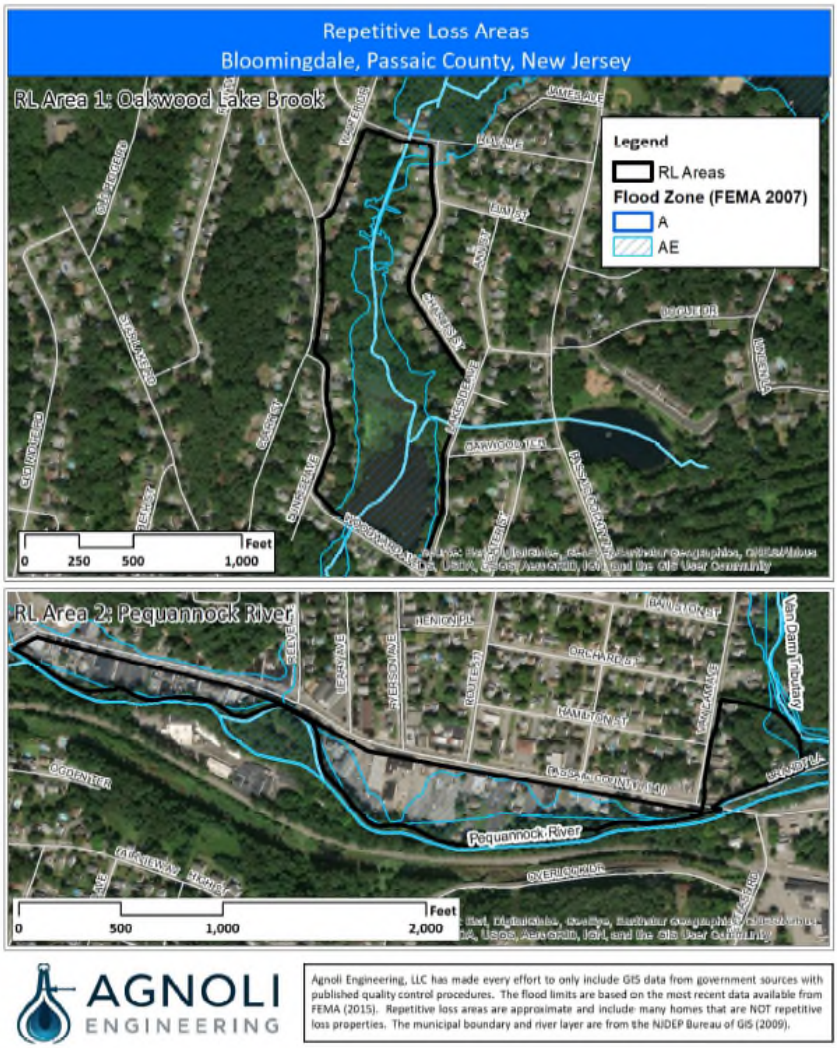
  As a CRS-participating community, the Borough Mayor notifies residents, both in or near repetitive loss property areas, on an annual basis via letter and includes a map of repetitive loss areas; refer to Figure 9.2-1. The letter provides property owners with options in terms of working with the Building Department to discuss flood protection alternatives, as well as how to protect their assets by preparing for a flood. Further, the letter provides information more specifically about flood insurance and permanent flood protection measures available to them and contact information to discuss financial assistance to implement these measures.

- **Funding:** The Recreation and Open Space Establishment Municipal Trust Fund is the main source of funding for open space acquisition and preservation. The Borough has also received funding through CDBG-DR to fund mitigation projects.

- **Flood:** Since the 2015 HMP, the Borough joined and actively participates in the CRS program – class 8. The Borough maintains elevation certificates on all new buildings and substantial improvements constructed in the Special Flood Hazard Area. In addition, the Borough contacts repetitive loss property owners in the community each year regarding their status and flood mitigation options. When people are looking to purchase flood-prone property, they are advised of the flood hazard.

  The Borough examines the regulatory flood data before any new development can proceed in the floodplain and continues to enforce the floodplain management provisions, as well as erosion, sediment control and water quality of the zoning, subdivision and building code ordinances.

Figure 9.2-1. Repetitive Loss Areas in the Borough of Bloomingdale as of 2018



9.2.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Bloomingdale's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.2-10 provides details regarding municipal-specific loss and damages the Borough of Bloomingdale experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.2-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	Debris removal
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both directions west of CR 625 and Randolph Ave. due to flooding.	Debris removal
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Overtime for debris removal

9.2.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.2-11 summarizes the Borough's risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.2-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	8,139	100-year MRP Hurricane:	2,611	100-year MRP Hurricane:	$331,322	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	0	NEHRP D&E:	0	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$1,253,922	
						2,500-year MRP building damages/loss:	$20,891,517	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,382	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators and HVAC; thermal		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	659			expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	693	1% annual chance	217	1% annual chance	$14,514,341	High
		0.2% annual chance	777	0.2% annual chance	468			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	10	Class A:	4	Class A:	$1,862,165	Moderate
		Class B:	7	Class B:	2	Class B:	$797,448	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	7	Number of buildings the hazard area:	3	Replacement cost value of buildings located in the hazard area:	$2,954,452	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Bloomingdale

- Number of repetitive loss (RL) properties: 13
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The following summarizes the critical facilities located in the FEMA delineated floodplain.

Table 9.2-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Animal shelter	Shelter	X		2020-Bloomingdale-002

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- The Pequannock River is the most significant waterway in the Borough. It flows west to east along the southern boundary of the Borough. There are several tributaries to the Pequannock River located in the Borough including Cold Spring Brook, Van Dam Brook, and Oakwood Lake Brook. These tributaries are located in the southern portion of the Borough and flow north to south. Posts Brook and its tributaries are other significant waterways in the Borough and located in the central and northern portions of Bloomingdale. That Borough has exhibited flooding, stream bank erosion, and diminished base flow in its streams. Many of the storm drains in Bloomingdale are undersized and during severe storm events, the systems do not have adequate capacity and cause a backwater effect and flooding upstream. The low-lying areas above and below Oak Street are subject to flooding by the Van Dam Brook. Flooding along the Pequannock River has also been noted. The Borough has identified Catherine and Elizabeth Streets, and Fitcher Street and Delazier Place near Oakwood Lake Brook as being periodically subject to flooding (Borough of Bloomingdale Stormwater Management Plan 2006). The Borough's undated mitigation strategy addresses the flood issues (Bloomingdale-1).

- The steep slopes in the Borough produce heavy runoff during large storms and produce flash flooding problems (Borough of Bloomingdale Open Space Master Plan). The Borough experiences flooding from Cold Spring Brook, Oakwood Lake Brook, Posts Brook Tributaries 1 and 2, Van Dam Brook, and the Van Dam Brook Tributary (FEMA FIS 2007). The Borough's undated mitigation strategy addresses the flood issues (Bloomingdale-4).

- Van Dam Avenue - Due to the over capacity of stormwater, steams cannot handle water, causing localized flooding issues impacting roadways and homes.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Bloomingdale that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Bloomingdale has significant exposure. A map of the Borough of Bloomingdale hazard area extent and location is provided on the following page. This map indicates the location of the regulatory floodplain, as well as identified critical facilities within the municipality.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Bloomingdale. The Borough of Bloomingdale has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Bloomingdale indicated the following:

- The hazard ranking for coastal storm changed from high in 2015 to medium in this plan update. This is because coastal storm impacts are mainly wind/rain related.
- The hazard ranking for the earthquake hazard changed from medium in 2015 to low in this update because there have been negligible impacts from historic events and the probability of an event that can cause large-scale impacts is low.
- The hazard ranking for severe weather and severe winter weather changed from high in 2015 to medium in this plan update. This is because advanced warning is available (i.e., alerts), the municipality has the capability to respond/clear snow and ice, and although these are frequent events the impacts are not considered high.

Table 9.2-13. Borough of Bloomingdale Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Medium	Medium	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Low	Medium	Medium	Medium	Medium	Medium

9.2.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.2-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: 1. Fixed Generator for Senior Center (shelter) 2. Fire Hall (shelter) 3. Sewer department building 4. Pump stations need two portable generators 5. W.T. Bergen School on 225 Glenwild Avenue	Borough of Bloomingdale	FEMA funding 1. Complete 2017 2. Fireman's Hall – completed 2017 3. Completed - Obtained a large portable generator and install a transfer switch; no permanent 4. Pump station portable generators - Complete 2017 for Natalie and was permanent (FEMA grant) 5. No progress; none of the three schools have a generator	Yes	2020-Bloomingdale-003
Install flood walls to raise river bank to prevent flooding on Main Street	Borough of Bloomingdale	Sloan Park Project had a culvert added and rebuilt the river banks to original heights along the Pequannock River, 2018-2019. Mitigated flooding on Main Street; Borough funded ($1Million). Complete.		
Develop process for the Borough to join and participate in the NFIP Community Rating System (CRS). This may include attending CRS workshop(s) if offered within the county.	Borough of Bloomingdale	Completed and Class 8		
Dredge and de-snag all brooks including Post Brook and Van dam Brook	Borough of Bloomingdale	Post Brook - Complete Van Dam - No Progress Oakwood Lake is needed as well and added to 2020 strategy	Yes	2020-Bloomingdale-001 and 2020-Bloomingdale-004
Redirect stormwater into the Pequannock river	Borough of Bloomingdale	The 'flats' is a portion of the Borough and stormwater accumulates because too water much for the tributaries to handle. Redirect stormwater into the Pequannock river at different locations would alleviate the flooding. As a start, de-snagging of the Brooks is the first step. Borough to determine if this is sufficient	Yes	2020-Bloomingdale-001 and 2020-Bloomingdale-004

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
		and if not will need to determine additional steps.		
"Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Currently there are two homes on Brandt Lane identified for acquisition. In addition, flood proofing two repetitive loss properties located on Charles Street and in Morris Lake development. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability."	Borough of Bloomingdale Engineering	Brandt Lane is an area of concern lately no recent issues. A new project will be added regarding the animal shelter and potential elevations of repetitive loss properties. In 2004, the Borough had 150 homes removed from the floodplain by doing a Letter of Map Amendment in the Charles Street neighborhood.		2020-Bloomingdale-002 and -006
Utilize the HMP as a guide during the next Master Plan update	Borough of Bloomingdale	The 2015 HMP was supplied to the planners, in progress; updated HMP will be provided as well	Yes	2020-Bloomingdale-005
Stormwater sewer reconstruction that was impacted by Hurricane Irene (collapsed storm line near 125 Main Street).	Borough of Bloomingdale	Completed; County-funded and CDBG funded in 2017		
Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance.	Elected Official's Office	Ongoing; capability; leveraging social media; schools and fairs		

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Bloomingdale participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Bloomingdale participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.2-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Bloomingdale would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.2-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Bloomingale-001	Van Dam Avenue Stream Restoration	**Problem:** Due to the over capacity of stormwater, steams cannot handle water, causing localized flooding issues impacting roadways and homes.	**Solution:** Implement streambank management techniques and restoration to provide increased capacity of the stream as well as additional floodplain capacity via green infrastructure solutions.	Existing	Coastal Storm, Flood, Severe Weather	1, 2	Borough Engineer	FEMA HMA	High	High	Short	High	SIP	PP
2020-Bloomingale-002	Brandt Lane Flood Wall	**Problem:** Due to low river walls, flooding occurs at the animal shelter which is a critical facility. There are also two repetitive loss properties on Brandt Lane as well. This is the Borough's priority to address flooding.	**Solution:** Install a flood wall to keep water from impacting the shelter and properties.	Existing	Coastal Storm, Flood, Severe Weather	1, 2	Borough Engineer	FEMA HMA; Borough match	High	High	Short	High	SIP	PP
2020-Bloomingdale-003	Backup power for Sewer Pump Station and Schools	**Problem:** During hazard events creating power outages, the sewer pump station, which is a critical facility cannot operate and service the residents and business of the service area. This facility requires 24/7 operation. In addition, the schools in the Borough do not have backup power.	**Solution:** Install a natural gas generator. W.T. Bergen School on 225 Glenwild Avenue and Vreeland Avenue Sewer Pump Station Generator	Existing	Coastal Storm, Earthquake, Extreme Temperature, Flood, Geological, Severe Weather, Severe Winter Weather, Wildfire	1, 2, 6	Borough Engineer; OEM Coordinator	FEMA HMA; Borough match	High	High	Short	High	SIP	PP
2020-Bloomin		**Problem:** Stormwater from the area drains into the wetland area and then		Both	Coastal Storm,	1, 2	Borough Engineer	FEMA HMA;	High	Medium	Short	High	NSP	NR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
gdale-004	Oakwood Lake Wetland Restoration	into Oakwood Lake. The wetland has become inefficient and does not drain quick enough. Due to lack of capacity of the existing drainage and existing wetland at Oakwood Lake, water backs up resulting in neighborhood flooding.	**Solution:** Redirect stormwater flow and increase capacity of this wetland area to reduce flood impacts. Additional studies may be required to identify natural system solutions to implement.		Flood, Severe Weather			Borough Capital		($50,000)				
2020-Bloomingdale-005	Integrate the HMP and climate change in the Master Plan Update	**Problem:** The Borough will be updating its Master Plan and it does not integrate the 2020 HMP and climate change.	**Solution:** On the horizon - implementing in the Master Plan that future developments require electric charging stations for car; Environmental Commission; participate in Sustainable NJ	Both	Coastal Storm, Dam Failure, Disease Outbreak, Earthquake, Extreme Temperature, Flood, Geological, Infestation and Invasive Species, Severe Weather, Severe Winter Weather, Wildfire	1, 2, 3, 4, 5								
2020-Bloomingdale-006	Repetitive Loss Properties	**Problem:** There are floodplains in the Borough, and properties, including repetitive loss properties		Existing	Coastal Storm, Flood,	1, 2	Mayor	Borough	High	Low	Short	High	LPR	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		in the Borough that have experienced historic flood losses and are vulnerable to flooding.	**Solution:** The Borough Mayor will distribute letters to flood-vulnerable property owners to inform them of their vulnerability; and mitigation options available. They can connect with the Borough Construction Official, Engineer and NFIP Floodplain Administrator to discussion options. The Borough will develop a grant application to implement elevations for volunteers who wish to mitigate their property.		Severe Storm									

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*

- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.2-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Bloomingdale-001	Van Dam Avenue Stream Restoration	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-Bloomingdale-002	Brandt Lane Flood Wall	1	1	1	1	1	0	0	0	1	1	1	1	1	1	11	High
2020-Bloomingdale-003	Backup Power for Sewer Pump Station and Schools	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Bloomingdale-004	Oakwood Lake Wetland Restoration	0	1	1	1	1	0	1	1	1	1	1	1	1	1	12	High
2020-Bloomingdale-005	Integrate the HMP and climate change in the Master Plan Update	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Bloomingdale-006	Mitigate Repetitive Loss Properties	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.2-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms		-001, -002, -006	-006	-004	-003	-001, -003	-005	-005, -006
Dam Failure					-003	-003	-005	-005,
Drought					-003	-003	-005	-005,
Earthquake					-003	-003	-005	-005,
Extreme Temperature					-003	-003	-005	-005,
Flood		-001, -002, -006	-006	-004	-003	-001, -003	-005	-005, -006
Geological Hazards					-003	-003	-005	-005,
Infestation and Invasive Species							-005	
Severe Weather		-001, -002, -006	-006	-004	-003	-001, -003	-005	-005, -006
Severe Winter Weather					-003	-003	-005	-005,
Wildfire					-003	-003	-005	-005,
Hazardous Materials					-003	-003	-005	-005,
Disease Outbreak					-003	-003	-005	-005,

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.2.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Bloomingdale followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.2-18. Contributors to the Annex

Name	Title	Method of Participation
Michael Hudson	OEM Coordinator	Attended meetings; contributed information to the update of the annex
Jon Dunleavy	Mayor, Stormwater Program Coordinator	Attended meetings; contributed information and data to the update of the annex; reviewed and approved the annex
Thomas Boorady	NFIP Floodplain Administrator, Borough Engineer	Attended meetings; contributed information and data to the update of the annex;
Albert Gallagher	Superintendent Public Works	Attended the mitigation strategy workshop; Reviewed the annex
Donna Mollineaux	CFO	Reviewed the annex

Name	Title	Method of Participation
Chris Walthour	Building Code Official	Reviewed the annex
Joseph Borell	Police Chief	Reviewed the annex
Eric Tuason	Fire Chief	Reviewed the annex

Figure 9.2-2. Borough of Bloomingdale Hazard Area Extent and Location Map 1

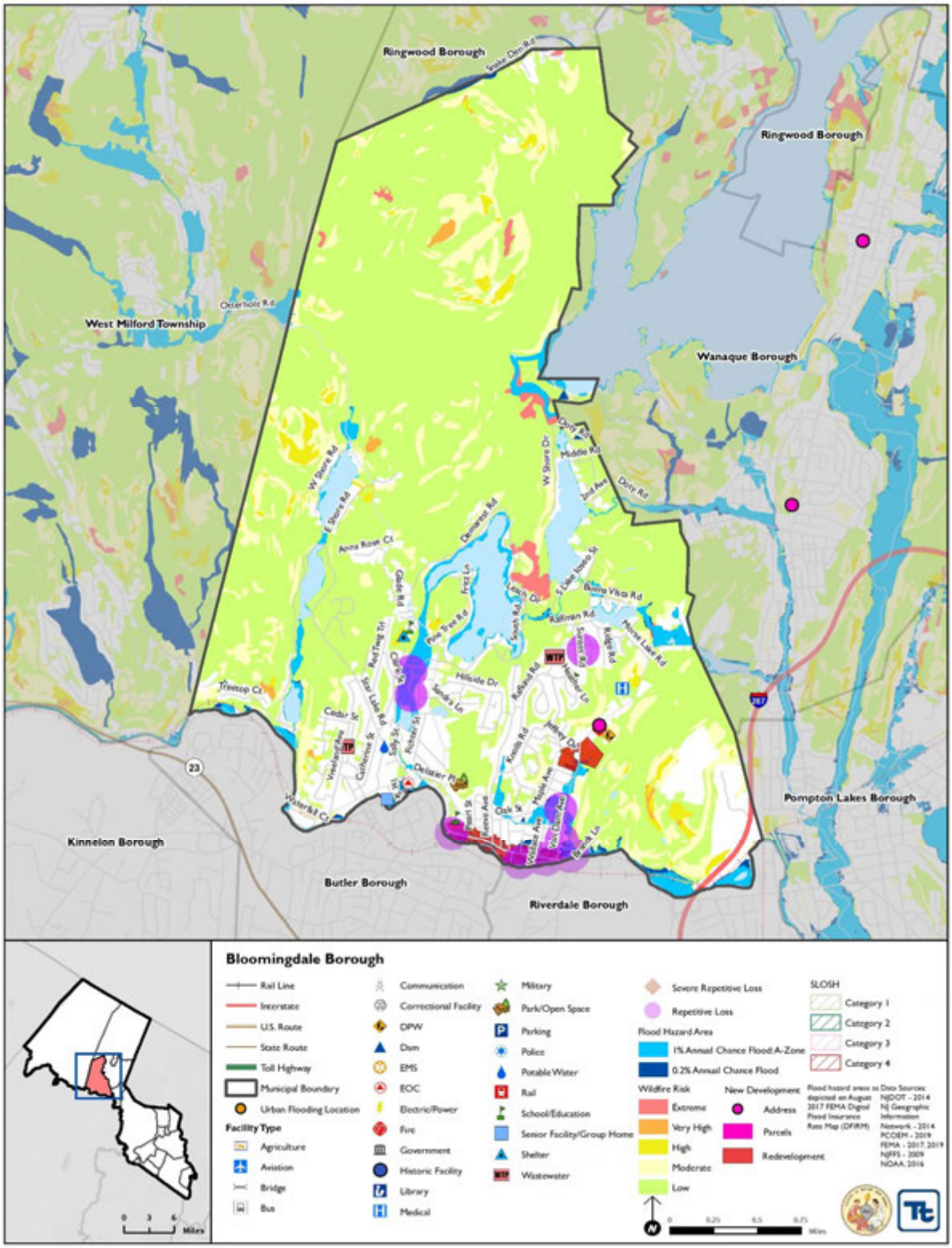
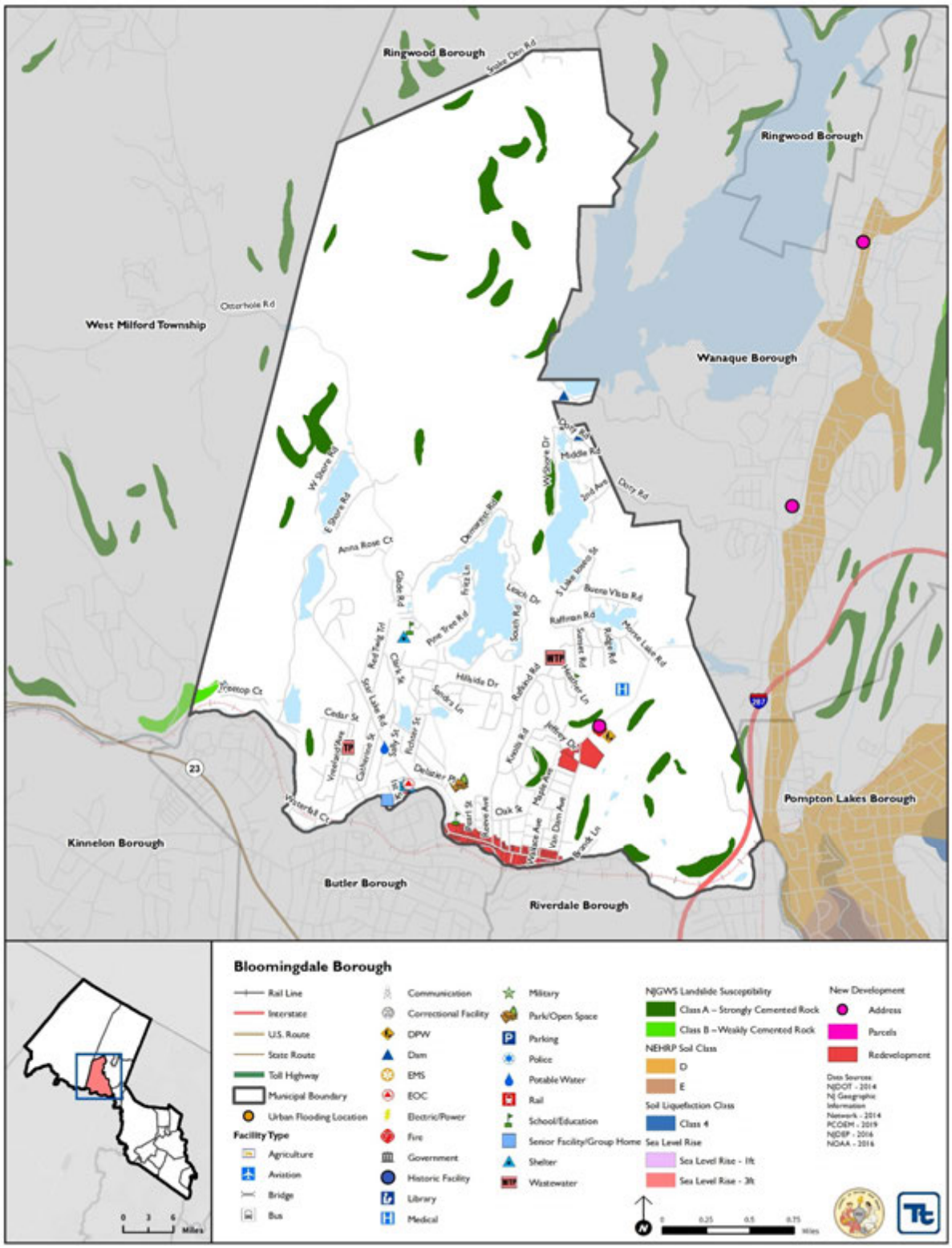


Figure 9.2-3. Borough of Bloomingdale Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Van Dam Avenue Stream Restoration		
Project Number:	2020-Bloomingdale-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	Due to the over capacity of stormwater, steams cannot handle water, causing localized flooding issues impacting roadways and homes.		
Action or Project Intended for Implementation			
Description of the Solution:	Implement streambank management techniques and restoration to provide increased capacity of the stream as well as additional floodplain capacity via green infrastructure solutions.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	To be determined by engineer	**Estimated Benefits (losses avoided):**	High; reduction in flood losses; reduction in flooded roadways, no detours/closures
Useful Life:	20+ years	**Goals Met:**	1, 2
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	2 years
Estimated Time Required for Project Implementation:	3 years	**Potential Funding Sources:**	FEMA HMA; Borough match
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues, homes and roads subject to continued flood impacts
	Elevate Roadway	High	This will not reduce or eliminate the problem; High cost
	Acquire flooded properties	High	Not feasible since there is a more cost-effective solution to maintain tax base

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Van Dam Avenue Stream Restoration	
Project Number:	2020-Bloomingdale-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Grant funding needed to implement
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Brandt Lane Flood Wall		
Project Number:	2020-Bloomingdale-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Due to low river walls, flooding occurs at the animal shelter which is a critical facility. There are also two repetitive loss properties on Brandt Lane as well. This is the Borough's priority.		
Action or Project Intended for Implementation			
Description of the Solution:	Install a flood wall to keep water from impacting the shelter.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	To be determined	**Estimated Benefits (losses avoided):**	High; reduce structural impacts to the critical facility; reduce emergency response costs
Useful Life:	30 years	**Goals Met:**	1, 2
Estimated Cost:	High	**Mitigation Action Type:**	Structural
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1-2 years
Estimated Time Required for Project Implementation:	3 years	**Potential Funding Sources:**	FEMA HMA; Local match
Responsible Organization:	Borough Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate the animal shelter	High	Not preferred solution
	Acquire properties	High	Loss of tax base

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Brandt Lane Flood Wall	
Project Number:	2020-Bloomingdale-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	
Fiscal	0	Grant funding required to implement
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Obtain generators - Vreeland Avenue Sewer Pump Station Generator and Schools		
Project Number:	2020-Bloomingdale-003		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	During hazard events creating power outages, the sewer pump station, which is a critical facility cannot operate and service the residents and business of the service area. This facility requires 24/7 operation. In addition, the schools in the Borough do not have backup power.		
Action or Project Intended for Implementation			
Description of the Solution:	Install a natural gas generator. W.T. Bergen School on 225 Glenwild Avenue and Vreeland Avenue Sewer Pump Station Generator		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	High	**Estimated Benefits (losses avoided):**	Ensures continuity of operations at a critical asset
Useful Life:	Based on generator selected	**Goals Met:**	1, 2, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	12 months
Estimated Time Required for Project Implementation:	6-12 months	**Potential Funding Sources:**	FEMA HMGP; Borough
Responsible Organization:	OEM; Mayor	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels	High	This would provide an alternate power source but may not be cost-effective.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generators for the Vreeland Avenue Sewer Pump Station Generator and Schools	
Project Number:	2020-Bloomingdale-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	14	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Oakwood Lake Wetland Restoration		
Project Number:	2020-Bloomingdale-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Stormwater from the area drains into the wetland area and then into Oakwood Lake. The wetland has become inefficient and does not drain quick enough. Due to lack of capacity of the existing drainage and existing wetland at Oakwood Lake, water backs up resulting in neighborhood flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	Redirect stormwater drainage and increase capacity of this wetland area to reduce flood impacts in the area.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	To be determined	**Estimated Benefits (losses avoided):**	High; reduce flood impacts
Useful Life:	To be determined	**Goals Met:**	1, 2
Estimated Cost:	$50,000	**Mitigation Action Type:**	NSP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1-2 years
Estimated Time Required for Project Implementation:	3 years	**Potential Funding Sources:**	FEMA HMA
Responsible Organization:	Borough Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build flood wall to protect area	High	Not preferred solution; would like to increase capacity of wetlands
	Relocate assets in the area	High	Not preferred solution.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Oakwood Lake Wetland Restoration	
Project Number:	2020-Bloomingdale-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	
Fiscal	1	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.3 CITY OF CLIFTON

This section presents the jurisdictional annex for the City of Clifton. The annex includes a general overview of the City of Clifton; an assessment of the City of Clifton's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.3.1 Hazard Mitigation Planning Team

The following individuals are the City of Clifton's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.3-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Angelina Tirado, OEM Coordinator 900 Clifton Ave., Clifton, NJ 07013 201-249-3269 atirado@cliftonnj.org	Michael Onder, Deputy OEM Coordinator 900 Clifton Ave., Clifton, NJ 07013 973-216-5711 monder@cliftonnj.org
NFIP Floodplain Administrator	
Ernie Tedesco, Construction Official 900 Clifton Ave., Clifton, NJ 07013 973-470-5815 Etedesco@cliftonnj.org	

9.3.2 Jurisdiction Profile

The City of Clifton was incorporated as a city by an act of the New Jersey State Legislature on April 26, 1917. Previously the city had been known as Acquackanonk Township, but two days before the act was passed, a referendum was held and the residents voted to give the city the name as it is known today. The City of Clifton is governed by the 1923 Municipal Manager Law form of government. The City has a mayor and six councilpersons.

The City is located in the southeast portion of Passaic County. It is bordered to the north by the City of Paterson and Borough of Woodland Park, to the east by the City of Passaic, to the west by the Township of Little Falls, and to the south by Essex County.

According to the U.S. Census, the 2010 population for the City of Clifton was 84,136. The estimated 2017 population was 86,207, a 2.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 3.7 percent of the population is 5 years of age or younger and 8.6 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.3.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.3-2 summarizes recent and expected future development trends, including major residential/commercial

development and major infrastructure development. Figure 9.3-1 and 9.3-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.3-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	1	8	12	7	4
Multi-Family	66	9	57	7	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Athenia Park Rec. Facility	Green Acres	1 fieldhouse	716 Clifton Ave	Low Wildfire	Ph 2 of 3 completed
Clifton Self Storage	Commercial	1 structure	1204 Broad St	None	Under construction
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Quest Diagnostics Headquarters	Commercial	1 structure	1153 Bloomfield Avenue	None	Under construction
Seton Hall University - Interprofessional Health Science (IHS) Campus	Educational	1 building	100/200 Metro Boulevard	None	Under Construction
The Chelsea at Clifton	Residential	1 building	782 Valley Road	None	Under Construction

** Only location-specific hazard zones or vulnerabilities identified.*

9.3.4 Capability Assessment

The City of Clifton performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.3.4). The City of Clifton identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the City of Clifton.

Table 9.3-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local	Yes	No	No
Comment: *Chapter 197 (Uniform Construction Codes); adopted by the City on 1/4/1977 by ordinance number 4376-77 and amended where applicable.*					
Zoning Code	Yes	Local	Yes	Yes	-
Comment: *Chapter 461 (Zoning); adopted by municipal council on 5/1/1979 by Ordinance Number 4502-79 and amended where applicable. The code guides the future growth and development of the City in accordance with a comprehensive plan of land use and population density, as set forth in the Master Plan of the City of Clifton that represents the most beneficial, economically productive and socially satisfactory relationships among the residential, commercial and industrial areas within the City of Clifton. The code has a steep slope overlay zone and establishes special land use development controls in the area along the west side of Valley Road to the western boundary of the City with Montclair, Little Falls, West Paterson, and Paterson. The vacant parcels of land in this area are considered environmentally sensitive due to the steep slope topography and susceptible to flooding, soil erosion, or damage/destroy public resources. The goal of this overlay zone is to mitigate potential hazards which exist in steep-sloped areas by reason of soil erosion, sedimentation, soil slippage, flooding, surface water runoff, rockfall, destruction of unique views, loss of vegetation and damage to downhill areas. Furthermore, it is appropriate that special design and construction practices be conducted within steep-sloped areas to preserve and maximize the best use of the natural terrain and to maintain the critical land forms intact to the extent reasonably possible and desirable.*					
Subdivisions	Yes	Local	Yes	-	-
Comment: *Chapter 399 (Subdivision of Land); adopted 6/22/1954)*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *Chapter 394 (Stormwater Control); adopted by the municipal council on 3/21/2006 by ordinance number 6567-06. This code establishes minimum stormwater management requirements and controls for major developments. Any development needs to incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development. The actions in the ordinance limit soil erosion, encourages non-structural controls, encourages recharge, and improves stormwater quality and reduce quantity.* • *Chapter 375 (Sewers) – this code was last amended on April 5, 2016. Through rules, regulations, and inspections illicit use of the sanitary and stormwater system is controlled. This code makes it unlawful to discharge restricted waste into any natural outlet within the City.* • *Chapter 374 (Sewer Utility) – this code enforces the operation, management, control, and maintenance of the sewer system and all extensions and improvements throughout the City. The overall goal is to safeguard and maintain the City's sanitary sewer system.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State	Yes	Yes	-
Comment: *Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	-	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	Yes	-
Comment: *City of Clifton Code, Chapter 461 – Planning Board responsible*					
Environmental Protection	No	-	-	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					
Flood Damage Prevention	Yes	Local	Yes	Yes	Yes – 2020-CLIFTON-004
Comment: *Chapter 239 (Flood Damage Prevention); adopted by the municipal council on 8/8/2007. The code requires new development and substantial improvements to be elevated at or above the base flood elevation; however, this does not meet the minimum one foot above the base flood elevation requirement in New Jersey.*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	Yes	Local	No	Yes	-
Comment: • *Chapter 433 (Trees and Shrubbery) - The City of Clifton adopted the Tree Removal and Protection Ordinance in 2002. The ordinance mandates that permits are required to cut down or remove any tree 4 inches or greater measured at the height of 4.5 feet above the ground. The application shall be submitted for all commercial, multifamily and one and two family properties. All applications are filed with our Department of Public Works (DPW). Warnings are issued as a first step of enforcement but then fines would be issued for non-compliance through the DPW.* • *Chapter 57 (Land Use Procedures) - The Planning Board and Zoning Board both have the authority in certain instances to review and approve Subdivisions and Site Plans in accordance with the development regulations that control improvements and buildings in flood hazard areas. This code refers to the flood damage prevention ordinance, subdivision of land, and zoning.* • *Chapter 393 (Special Improvement District) – adopted September 15, 1998*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: *Updated in 2014 – Zoning Department*					
Capital Improvement Plan	Yes	Local	No	-	-
Comment: *Finance Department - Included in the annual budget and contains line items for capital improvement projects*					
Disaster Debris Management Plan	Yes	Local	No	-	-
Comment: *TDMA (Temporary Debris Management Area) through the NJDEP at the DPW garage – February 2020 – it will be incorporated into the City's EOP*					
Floodplain or Watershed Plan	No	-	-	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	-	-
Comment: *Updated in 2008; DPW responsible. The City's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
integrity of stream channels. The Plan details specific changes to the City's Code, which will incorporate nonstructural stormwater management strategies into the ordinances. Additionally, the plan provides specific mitigation projects that could be implemented, if on-site stormwater management criteria cannot be met.					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	-	-
Comment:					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	-	-
Comment: *Downtown Clifton*					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	Yes	Local	No	Yes	-
Comment: *2016-2020 Community Forestry Management Plan. The purpose of the plan is to improve the quality of life in the City by maximizing the environmental, social, and economic benefits of trees to the community while minimizing the associated costs and liabilities. Several of the goals align with hazard mitigation and are to secure safety from fire, flood, panic and other natural and man-made disasters consistent with the Master Plan, and the preservation, planting and/or maintenance of buffers and filter strips along waterways and drainage courses, minimization of impervious groundcover, and the design and construction of stormwater collection systems in conjunction with new development to ensure efficient, natural drainage, minimize the risk of serious flooding, and minimize the runoff of silt, nutrients, and pollutant laden stormwater into local water networks as related to the Stormwater Management Plan. Additionally, the City's master plan is used to guide future growth and development in the City and this plan refers to the master plans' goals, along with the stormwater management plan and the tree removal protection ordinance.*					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	Local	No	-	-
Comment: *Through the Economic Development official*					
Other	Yes	Local	No	-	-
Comment: • *Risk Communications Plan for Clifton Health Department (May 3, 2017) – This plan discusses the responsibilities of the health department during a disaster or public health emergency. They are responsible for providing public information and educational programs to: Provide support during the four phases of the emergency: mitigation, preparedness, response, and recovery operations; Provide the public with accurate, timely and easily understood event- related information concerning protective*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
actions, health notices and assistance information; control rumors; coordinate information releases with all participating public and private agencies, emergency responders, and all levels of government to support public officials and media representatives in satisfying the public's demand for accurate and consistent information; limit public information activities to the Clifton-specific events and actions; the Local Health Officer of the City of Clifton may serve as spokesperson for the EOC or be a subject matter expert and support the Municipal PIO. This determination is made in cooperation with the Municipal Government and/or OEM Coordinator; provide information using health literacy principles for limited language proficient populations; and coordinate with NJDOH, Northwest Region, Passaic County Health Department, St. Mary's General Hospital, and St. Joseph's Regional Medical Center for Subject Matter Experts as needed.					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	-	-
Comment: *The City of Clifton's EOP has been updated in 2018 and was approved by the New Jersey State Police (NJSP). The plan has annexes which are updated every year if needed. The plan is approved by NJSP every four years. There are appendixes that go along with the plan and staff changes are updated if there is a new hire, promotion or retirement.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	-	-
Comment: *part of the EOP*					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	Local	No	-	-
Comment: *Health Department responsible for maintaining and updating*					
Other	No	-	No	-	-
Comment:					

Table 9.3-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes – through the zoning and planning departments/board
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No – the City is nearly built out

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the City of Clifton.

Table 9.3-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	City of Clifton Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	City of Clifton Environmental Commission
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Rave (reverse 911); public access TV channel; municipal website; CERT and LEPC
Maintenance program to reduce risk	Yes	Tree trimming, storm drain clearing, and sewer maintenance
Mutual aid agreements	Yes	Surrounding municipalities, American Red Cross and Passaic County; UASI
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering and Zoning
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering and Construction Code
Planners or engineers with an understanding of natural hazards	Yes	Engineering and Construction Code
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Engineer
Staff with education/knowledge/training in low impact development	Yes	City Council
Surveyor	Yes	Engineering
Stormwater engineer	Yes	Engineer
Personnel skilled or trained in GIS applications	Yes	Engineering and OEM
Local or state water quality professional	Yes	Passaic Valley Water Commission
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	Yes	Engineer and County Planning
Environmental specialist	No	-
Grant writers	Yes	Consultant
Resilience Officer	No	-
Other	Yes	CERT Program Manager

Fiscal Capability

The table below summarizes financial resources available to the City of Clifton.

Table 9.3-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes

Financial Resource	Accessible or Eligible to Use?
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the City of Clifton.

Table 9.3-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - City Manager is the PIO
Do you have personnel skilled or trained in website development?	Yes - website was built by consultant; city maintains the website
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes - Rave (reverse 911); public access TV channel; municipal website; CERT and LEPC; social media (Facebook and Twitter). The City posts important information and alerts before, during, and after storm events to inform residents and keep them up-to-date.
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes – Facebook, Twitter, and Instagram
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes – Hazardous Material Control Board - makes recommendations to ensure that storage and use of hazardous chemicals in Clifton are done in accordance to federal, state, and local laws to ensure the safety of the residents and businesses in Clifton. All new businesses within the City of Clifton are required to complete a Building Department CBC application and must report any hazardous materials that will be used or stored on-site via HMCB application and Fire Department Inventory Sheet.
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes – social media, Clifton magazine, Channel 40 public access
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - Rave (reverse 911); public access TV channel; municipal website; CERT and LEPC; social media (Facebook and Twitter)

Community Classifications

The table below summarizes the classifications for community programs available to the City of Clifton.

Table 9.3-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	4 - 1 &2 family 3 - commercial and industrial	10/24/2013
Storm Ready Certification	No	-	-

Program	Participating?	Classification	Date Classified
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	12/11/2019

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

- Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality? Yes - NJDEP, State Climatologist
- Is the administrative supportive of integrating climate change in policies or actions? Yes – currently part of Sustainable Jersey and a Tree City USA community
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality? Yes - varies throughout municipal departments

Table 9.3-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.3-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	August 8, 2007

Criterion	Response
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Overall, meets the minimum; however, it does not meet the minimum state requirement for new development and substantial improvements in the floodplain which requires a minimum of one foot above the base flood elevation. Refer to 2020-CLIFTON-004
When was the most recent Community Assistance Visit or Community Assistance Contact?	Not identified
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? • If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No, the City is currently not in the CRS program
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	141 policies in force $46,026,700 insurance in force $289,934 premium in force
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	128 claims 4 open / 32 closed without payment $3,417,513 total payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of 2018*

Additional Areas of Existing Integration

- Clifton Community Emergency Response Team (CERT) promotes signing up residents and businesses at City events by providing community public outreach at National Night Out, City Picnic and other street fairs and events.
- The Clifton Green Team in collaboration with Passaic Valley Sewerage Commission and the NJ Watershed Ambassador hosted a Build Your Own Rain Barrel Workshop on May 4, 2019, at Clifton City Hall and was open to all City residents. This is a yearly event that started in 2016. Rain Barrel workshops promote the bigger picture of Sustainable Living providing water conservation, reducing stormwater runoff and mitigate water pollution.
- City of Clifton Health Department use various methods to distribute public health alerts and information to the public. This includes radio, LINCS health alert network, telephone, face-to-fact media briefings, Citizen Alert, Communication NXT, television, newspapers, distribution of printed material, emergency hotline activation, NJ 2-1-1, municipal website, and social media.
- Master Plan Reexamination Report (2008): The Plan addresses issues regarding hazard mitigation with the incorporation of goals that include securing safety from fire, flood, panic and other natural and man-made disasters, to provide adequate light, air and open space, to protect environmentally sensitive areas

from development, provide adequate community facilities and encourage active citizen participation in the planning process.
    - The City plans to achieve these goals through various actions including:
        - Use of ordinances to restrict development of environmentally sensitive areas
        - The City's land use policy discourages infrastructure improvements that would impact environmental features
        - Addition of new requirements to zoning ordinances, including environmental impact statement requirements and shade tree requirements
        - Implement an open space tax of $0.75 per $1000 of assessed value
- Operations and Administration: The DPW conducts stormwater maintenance clearing catch basins and rebuilding/reconstructing basins. The City also conducts tree maintenance around power lines.
- Outreach: The City's website has a link to sign-up for their Emergency Notification system. Additionally, the site hosts information on construction updates and traffic advisories, as well as special community events, which include the location of flu clinics. A map of the Clifton Emergency Snow Route is also available on the website. The City also maintains a Reverse 911 system. Disaster Preparedness Day was held at the Clifton. The City is partnering with the County to conduct the hazardous material waste collection day.
- A Community Emergency Response Team (CERT) was started in 2014.
- Funding: The Capital Improvement Budget funds the match for mitigation projects. The generator at City Hall was funded through the Capital Improvement Budget.
- The City's Environmental Commission/Green Team is made up of 12 members. Their mission is to:
    - Play a coordinating role among the diverse actors in environmental protection:
        - Boards of health and utilities authorities
        - Local planning boards
        - The New Jersey Department of Environmental Protection (NJDEP)
        - Soil Conservation Districts
        - U.S. Environmental Protection Agency (USEPA)
    - Promote regional and long-range environmental planning
    - Reach local citizens through educational programs, publications and meetings
    - Work with neighboring commissions and other organizations to address regional and state-wide environmental problems

9.3.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The City of Clifton's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.3-11 provides details regarding municipal-specific loss and damages the City experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.3-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	None identified
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both directions west of CR 625 and Randolph Ave. due to flooding.	None identified
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	None identified

9.3.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.3-12 summarizes the City of Clifton risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.3-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	86,207	100-year MRP Hurricane:	21,859	100-year MRP Hurricane:	$6,271,624	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	14,874	NEHRP D&E:	2,812	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	3	Liquefaction Class 4:	9	500-year MRP building damages/loss:	$764,094	
						2,500-year MRP building damages/loss:	$13,364,243	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	12,718	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	8,190			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	109	1% annual chance	61	1% annual chance	$4,717,444	High
		0.2% annual chance	946	0.2% annual chance	278			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	16	Class A:	6	Class A:	$33,675,323	Moderate
		Class B:	0	Class B:	0	Class B:	$o	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	4	Replacement cost value of buildings located in the hazard area:	$30,902,070	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the City of Clifton.

- Number of repetitive loss (RL) properties: 7 (see 2020-CLIFTON-003 in Table 9.3-15)
- Number of severe repetitive loss (SRL) properties: 2
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019
Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.3-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Passaic Valley Sewage Pump Station	Wastewater Pump	X	X	2020-CLIFTON-001

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- The City of Clifton has exhibited water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. Many of the culverts associated with road crossings in the City are undersized and during severe weather events, they cause a backwater effect and flood upstream. Specific areas that are affected including:
  - Third River culvert at Woodlawn Avenue
  - Third River culvert at Edwards Road
  - Third River culvert at Charles Street
  - Third River culvert at Grove Street
  - Weasel Brook culvert at the Erie Railroad
  - Weasel Brook culvert at Main Avenue

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the City of Clifton that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the City of Clifton has significant exposure. A map of the City of Clifton hazard area extent and location is provided on the following page. This map indicates the location of the regulatory floodplain, as well as identified critical facilities within the municipality.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The

ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the City of Clifton. The City of Clifton has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the City indicated the following:

- The City adjusted the ranking of drought from medium to low based on event history.
- The City adjusted the ranking of earthquake from medium to low based on event history and experience.
- The City adjusted hazardous substances from medium to low because many of the facilities that dealt with hazardous substances are no longer located in the City.

Table 9.3-13. City of Clifton Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Low	Medium	Low	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Low	Low	Medium	Medium	Medium	Low

9.3.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.3-14. Status of Previous HMP Mitigation Actions

2015 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
				Check if Yes	Enter 2020 HMP Action #
Clifton-1	Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: - DPW - City fire departments - City Hall complete - Clifton Senior Center (shelter) - Clifton High School	City of Clifton	In Progress – generators have been installed at the DPW, majority of the fire stations (all but Station 4), City Hall and the Clifton Senior Center	Yes – this will include Station 4 and Clifton High School	2020-CLIFTON-002
Clifton-2	Use the Hazard Mitigation Plan as a guide when updating the Master Plan.	City of Clifton	Ongoing Capability	-	-
Clifton-3	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance. This program will include the continued purchase of preparedness materials for the public.	OEM	Ongoing Capability	-	-
Clifton-4	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress). Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	Ongoing Capability; a new action in the updated mitigation strategy to reach out to repetitive loss property owners to discuss mitigation options and obtain funding identified.	Yes	2020-CLIFTON-003
Clifton-5	Delawanna Avenue Stormwater Improvements	Fire Department	Completed	-	-
Clifton-6	East 7th Street 60" Storm sewer Project	Fire Department	Completed	-	-

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The City of Clifton participated in a risk assessment workshop in February 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The City of Clifton participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.3-15 summarizes the comprehensive-range of specific mitigation initiatives the City of Clifton would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the 4 FEMA mitigation action categories and the 6 CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.3-15. Proposed Hazard Mitigation Initiatives and Associated Priority

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-CLIFTON-001	Critical Facility - Passaic Valley Sewage Pump Station	**Problem**: The Passaic Valley Sewage Pump Station is located in the 1% annual chance flood area. **Solution**: The City does not own this facility. They will perform outreach to the Passaic Valley Sewage Commission informing them the facility is located in the floodplain and provide mitigation options to protect from flood damage.	Existing	Coastal Storm, Flood, Severe Weather	2, 4, 6	Construction Official, City OEM	City Budget	Increase awareness, provide education to critical facility owner/operator	<$10,000	Within 1 year	High	EAP	PI, PP
2020-CLIFTON-002	Backup Power for Fire Department and High School	**Problem**: Station 4 (fire department) and Clifton High School are considered critical facilities that provide essential services to the community. In the event of a power outage, the facilities can operate properly. **Solution**: Purchase and install backup power at Station 4 and Clifton High School.	Existing	Coastal Storm, Dam Failure, Disease Outbreak, Earthquake, Extreme Temperature, Flood, Geological, Severe Weather, Severe Winter Weather, Wildfire	1, 2, 3, 6	City Engineer, Fire Department, Administration	FEMA HMGP, City budget	Continuity of operations	$100,000	Within 2 years	High	SIP	PP, ES
2020-CLIFTON-003	Outreach to Floodprone Properties	**Problem**: There are seven repetitive loss properties in the City and two severe repetitive loss properties. **Solution**: The City will conduct an outreach to the repetitive and severe repetitive loss properties to inform them different mitigation options (e.g. elevate utilities, remove items from basement, etc.).	Existing	Flood	1, 2, 3	Construction Official, OEM	City budget	Increase awareness, provide education to homeowners on how to protect homes	<$10,000	Within 1 year	Medium	EAP	PI
2020-CLIFTON-004	Update the Flood Damage	**Problem:** The current flood damage prevention ordinance (Chapter 239) states that any	New and Existing	Flood	All	City Administration	City Budget	Increase protection of	<$10,000	Within 1 year	High	LPR	PR, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
	Prevention Ordinance	new development or substantial improvements must be elevated at or above the base flood elevation. This does not meet the minimum requirement set by the State of New Jersey. **Solution:** Update the current flood damage prevention ordinance to require new construction and substantial improvements to be elevated at least one foot above the base flood elevation.						development in the floodplain					

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*

- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.3-16. Summary Evaluation and Action Priority

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-CLIFTON-001	Critical Facility - Passaic Valley Sewage Pump Station	1	1	1	1	1	1	1	0	0	1	0	1	0	0	9	High
2020-CLIFTON-002	Backup Power for Fire Department and High School	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High
2020-CLIFTON-003	Outreach to Floodprone Properties	1	1	1	1	0	1	0	0	1	1	0	1	0	0	8	Medium
2020-CLIFTON-004	Update the Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	0	0	1	0	1	1	0	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.3-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storm		-001, -002	-001		-002	-002		
Dam Failure		-002			-002	-002		
Disease Outbreak		-002			-002	-002		
Drought		-002			-002	-002		
Earthquake		-002			-002	-002		
Extreme Temperature		-002			-002	-002		
Flood	-004	-001, -002	-001, -003		-002	-002		-004
Geological Hazard		-002			-002	-002		
Hazardous Substances		-002			-002	-002		
Infestation and Invasive Species								
Severe Weather		-001, -002	-001		-002	-002		
Severe Winter Weather		-002			-002	-002		
Wildfire		-002			-002	-002		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.3.8 Staff and Local Stakeholder Involvement in Annex Development

The City of Clifton followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.3-18. Contributors to the Annex

Entity	Title	Method of Participation
Angelina Tirado	OEM Coordinator	Identified point of contact, attended meetings, provided input on annex development
Michael Onder	Deputy OEM Coordinator	Identified point of contact, attended meetings, provided input on annex development, provided mitigation actions
Ron Laube	Deputy OEM Coordinator	Attended meetings
Ernie Tedesco	Construction Official/ NFIP Floodplain Administrator	Provided input on the annex

Entity	Title	Method of Participation
James Anzaldi	Mayor	Reviewed the annex
Allan Ryff	Land Use Planner	Reviewed the annex
Joe Kunz	Fiscal/CFO	Reviewed the annex
Jason Vanwinkle	Public Works Director	Reviewed the annex
Thomas Rinaldo	Chief of Police	Reviewed the annex
Frank Rezioso	Fire Official	Reviewed the annex

Figure 9.3-1. City of Clifton Hazard Area Extent and Location Map 1

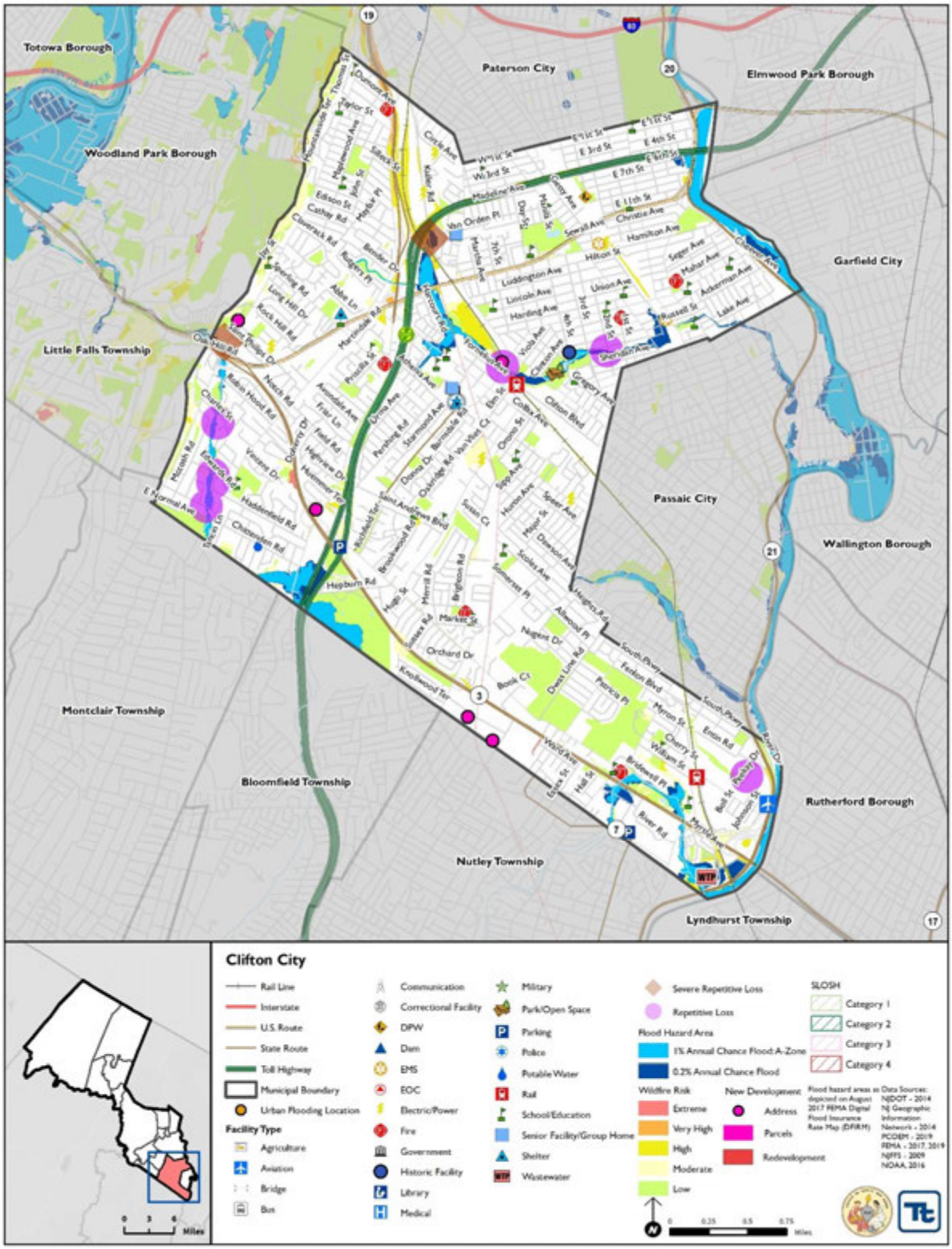
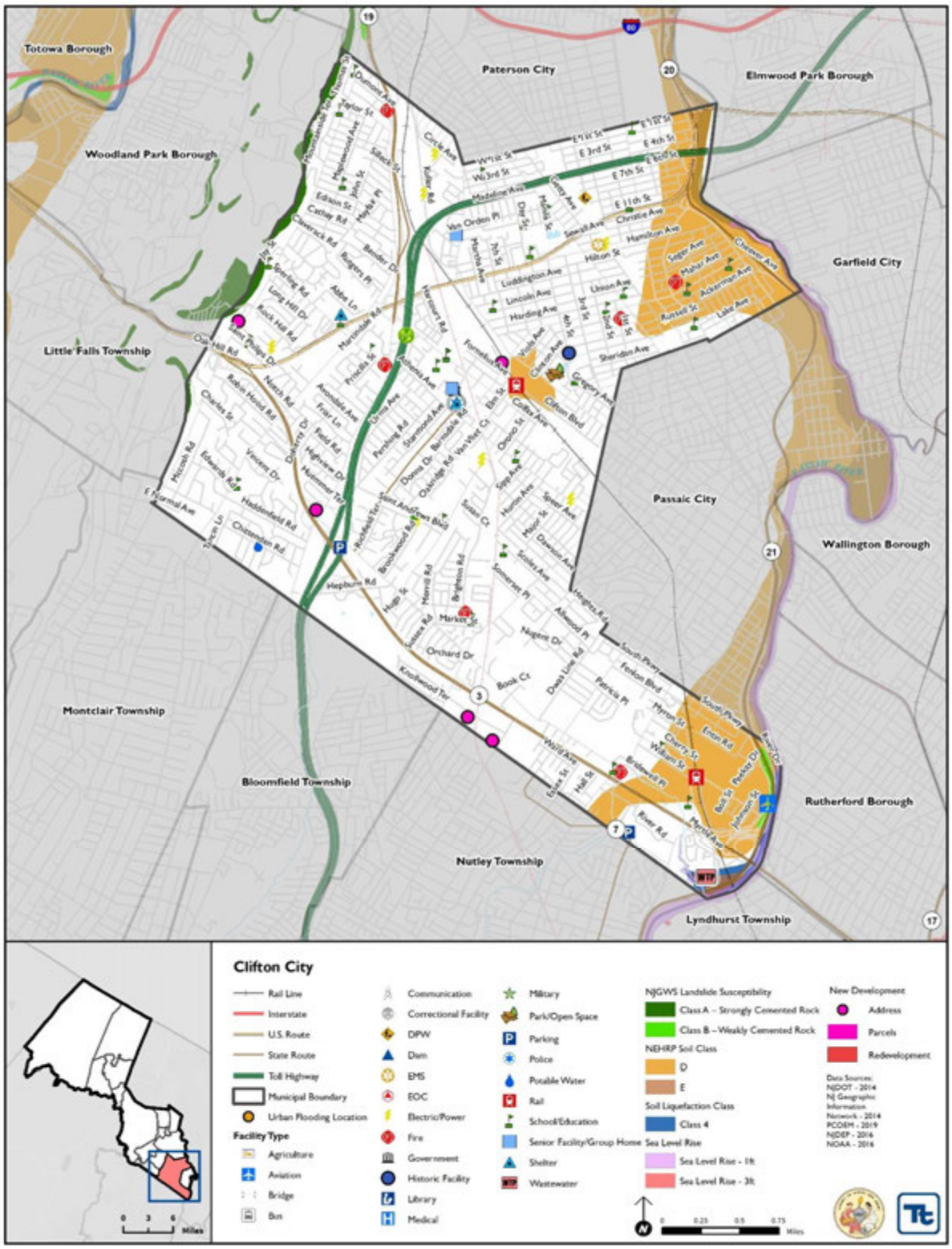


Figure 9.3-2. City of Clifton Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Critical Facility - Passaic Valley Sewage Pump Station		
Project Number:	2020-CLIFTON-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	Passaic Valley Sewerage Pump Station is a critical facility that provides essential services to the City and surrounding area. The pump station is located in the 1% and 0.2% annual chance flood areas and might be susceptible to flood damages. The City does not own this facility and does not have the jurisdiction to mitigate the facility.		
Action or Project Intended for Implementation			
Description of the Solution:	The City of Clifton will perform outreach to the Passaic Valley Sewage Commission informing them the facility is located in the floodplain and provide mitigation options to protect from flood damage. Options can include install flood doors, purchasing deployable flood walls, and elevating utilities above the base flood elevation.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Increase awareness, provide education to critical facility owner/operator
Useful Life:	N/A	**Goals Met:**	2, 4, 6
Estimated Cost:	Less than $10,000	**Mitigation Action Type:**	Education and Awareness Program (EAP)
Plan for Implementation			
Prioritization:	Medium	**Potential Funding Sources:**	City Budget
Estimated Time Required for Project Implementation:	Within 1 year		
Responsible Organization:	Construction Official, City OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate structure	$1 million+	Not cost effective; not feasible – facility cannot be elevated
	Relocate structure	$1 million+	Not cost effective; not feasible – City is fully developed and nowhere to relocate the facility

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Critical Facility - Passaic Valley Sewage Pump Station	
Project Number:	2020-CLIFTON-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	-
Property Protection	1	Provide the owner/operator options to reduce or eliminate flood damage to the pump station
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	Meets several goals of the 2020 HMP Update
Political	0	-
Legal	1	The City has the legal authority to notify the facility owner/operator but not does not have the legal authority to mitigate the facility
Fiscal	1	The project can be funded by the City's budget
Environmental	0	No negative environmental impacts
Social	0	-
Administrative	1	The City has the personnel and administrative capabilities to implement this action.
Multi-Hazard	1	Coastal Storm, Flood, Severe Weather
Timeline	1	To be completed within one year
Agency Champion	0	-
Other Community Objectives	0	-
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Backup Power for Fire Department and High School		
Project Number:	2020-CLIFTON-002		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	Station 4 (fire department) and Clifton High School are considered critical facilities that provide essential services to the community. In the event of a power outage, the facilities can operate properly.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install backup power at Station 4 and Clifton High School.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations
Useful Life:	N/A	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$100,000	**Mitigation Action Type:**	Structure and Infrastructure Project (SIP)
Plan for Implementation			
Prioritization:	Medium	**Potential Funding Sources:**	FEMA HMGP or FMA, City Budget
Estimated Time Required for Project Implementation:	Within 2 years		
Responsible Organization:	City Engineer, Fire Department, Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels at each facility	$35,000+	Costly, weather dependent, building property does not have the capacity for solar panel installation
	Install wind turbines	$10,000+	Costly, weather dependent, requires open space

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Power for Fire Department and High School	
Project Number:	2020-CLIFTON-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Allow fire department to stay operational and provide emergency services to residents; allow school to be used as a shelter
Property Protection	1	Allow buildings to properly function during power outages
Cost-Effectiveness	1	Benefits outweigh the costs of the project
Technical	1	
Political	1	
Legal	1	The City has the authority to implement this project
Fiscal	0	The City will need to seek grant funding to complete project
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	To be completed within two years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

9.4 BOROUGH OF HALEDON

This section presents the jurisdictional annex for the Borough of Haledon. The annex includes a general overview of the Borough; an assessment of the Borough of Haledon risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.4.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Haledon's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.4-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Mounir Almaita, OEM Coordinator 510 Belmont Avenue, Haledon, New Jersey 07508 862.262.4294 malmaita@haledonpd.org	Lt. George Guzman, Deputy OEM Coordinator 510 Belmont Avenue, Haledon, New Jersey 07508 862.262.2832 gguzman@haledonpd.org
NFIP Floodplain Administrator	
Phil Cheff, Construction Official 510 Belmont Avenue, Haledon, New Jersey 07508 973-595-7766 pcheff@haledonboronj.com	

9.4.2 Jurisdiction Profile

The Borough of Haledon was incorporated in 1908, having been the Oldham district of the former Passaic County municipality of Manchester Township. Home rule secession of municipalities in New Jersey was common and other examples include nearby Woodland Park (formerly West Paterson) and Elmwood Park, both of which were once part of Paterson. Today, the Borough is governed by the Borough form of government, with a mayor and six member council. According to the U.S. Census Bureau, the Borough has a total land area of 1.156 square miles, of which 1.155 square miles is land and 0.001 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Haledon was 8,318. The estimated 2017 population was 8,440, a 1.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.9 percent of the population is 5 years of age or younger and 12 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.4.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.4-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.4-1 and 9.4-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.4-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018	2019
Number of Building Permits for New Construction Issued Since the Previous HMP						
Single Family	0	0	0	0	0	4
Multi-Family	2	0	0	0	0	10
Other (commercial, mixed-use, etc.)	0	0	0	0	0	Not available

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Belmont Ave streetscape project	Commercial	No buildings; landscaping project	Belmont Ave	N/A	Complete
Belmont Town Square	Commercial	No buildings, landscaping project	407 Belmont Ave.	None	Complete
Casa de Calabra	Residential	multiple units	78 Barber St	None	Complete
The Gatherings	Residential	1 building	1205 Gatherings Drive	Low Wildfire	Complete
John Street Apartments	Residential	1 building	2 John Street	None	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Leonhard Wax Company	Residential	Number of structures is pending	136 Church St.	Low Wildfire	Pending

** Only location-specific hazard zones or vulnerabilities identified.*

9.4.4 Capability Assessment

The Borough of Haledon performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.4.4). The Borough of Haledon identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Haledon.

Table 9.4-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	-	-
***Comment**: State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.). The Construction Code Department will require all regulated building improvements and new development to meet the minimum standards for safety from fire, flood and other natural and manmade disasters.*					
Zoning Code	Yes	Local Building Dept	Yes	-	-
***Comment:** Borough Ordinance 405; brings all the Ordinance requirements together to control development ensuring that steep slopes are protected, stormwater measures are incorporated, and that buffers, landscaping and flood hazard measures are addressed. All development policies in the Borough are incorporated into the Zoning Code.*					
Subdivisions	Yes	Local Building Dept	Yes	-	-
***Comment:** Provisions regarding subdivisions is found in the Zoning Code (Chapter 405). Any subdivision proposals must be submitted to the Planning Board for their review and approval.*					
Stormwater Management	Yes	Local - DPW	Yes	Yes	-
Comment: • *Chapter 345 - Stormwater Control - Adopted by Bourgh Council on 4/19/2006 - Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards. Development shall incorporate a maintenance plan for the stormwater management measures. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department Landscape Project. To the maximum extent practicable, the standards shall be met by incorporating nonstructural stormwater management strategies into the design.* • *Chapter 346 - Stormwater Quality - adopted by the Borough Council on 9/6/2010 – prohibits the spilling, dumping, or disposal of materials, other than stormwater, to the municipal separate storm sewer system operated by the Borough. It also prohibits the spilling, dumping, or disposal of materials other than stormwater in such a manner as to cause the discharge of pollutants to the municipal separate storm sewer system*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	No	-	-	-	-
Comment:					
Growth Management	Yes	Local Building Dept	Yes	-	-
***Comment:** Incorporated in the Zoning Code (Chapter 405)*					
Site Plan Review	Yes	Local Planning Board	Yes	-	-
***Comment:** Chapter 332 - Site Plan Review; adopted by the Borough Council on 7/12/1989. The purpose of this chapter is to provide rules, regulations and standards to guide the development of land sites in the Borough of Haledon in order to protect the public health, safety, convenience and general welfare of the municipality.*					
Environmental Protection	No	-	-	-	-
Comment:					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
***Comment:** Chapter 191 - Floodplain Management; adopted by Borough Council on 12/9/1987 and amended where applicable. The code requires new development and substantial improvements to be elevated at or above the base flood elevation; however, this does not meet the minimum one foot above the base flood elevation requirement in New Jersey. The code helps maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood-blight areas. Ensure that potential home buyers are notified that property is in a flood area. To ensure that those who occupy the areas of special flood hazard assume responsibility*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
for their actions. On September 20, 2007, the Borough added that no structure or land shall be constructed, located, extended, converted, or altered without full compliance with this chapter.					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	Yes	Local	-	-	-
Comment: • *Municipal Separate Storm Sewer System (MS4) – DPW responsible for maintaining; Borough Ordinance 346* • *Chapter 262 - Parks and Recreation Areas; adopted by the Borough Council on 8/13/1980 and amended where applicable* • *Chapter 321 - Sewers; adopted by the Borough Council on 8/14/1985* • *Chapter 380 - Trees - adopted by Borough Council and last amended on 2/21/2013 – code states that tree planting and protection will lead to better erosion control, drainage, and neighborhood climate control (e.g. shade).*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local Borough Clerk	Yes	-	-
Comment: Master Plan Reexamination, 2010					
Capital Improvement Plan	Yes	Local Administrator	No	Yes	-
Comment: *Part of the annual budget for the Borough. The 2019 budget did not contain capital improvement funding but it did support department and staff that implement plans and mitigation actions*					
Disaster Debris Management Plan	No	-	No	-	-
Comment:					
Floodplain or Watershed Plan	No	-	-	-	-
Comment:					
Stormwater Management Plan	Yes	Local - DPW	Yes	-	-
Comment: *The goals of this plan is to reduce flood damage, including damage to life and property; minimize stormwater runoff from new development; reduce soil erosion from any development or construction project; assure the adequacy of existing bridges, culverts and other in stream structures; maintain groundwater recharge; maintain the integrity of stream channels for their biological functions, as well as drainage; minimize pollutants in stormwater runoff from new and existing development; protect public safety through the proper design and operation of stormwater basins. This plan refers to the Master Plan and indicates that the Borough will review the Master Plan and ordinances to modify certain sections to incorporate nonstructural stormwater management strategies.*					
Stormwater Pollution Prevention Plan	Yes	Local - DPW	Yes	-	-
Comment: *Stormwater Pollution Prevention Plan – July 2017*					
Urban Water Management Plan	No	-	-	-	-
Comment:					
Habitat Conservation Plan	No	-	-	-	-
Comment:					
Economic Development Plan	No	-	-	-	-
Comment:					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	No	-	-	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Community Forest Management Plan	No	-	-	-	-
Comment:					
Transportation Plan	No	-	-	-	-
Comment:					
Agriculture Plan	No	-	-	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local OEM	Yes	-	-
***Comment**: Emergency Operations Plan and Emergency Response Plan*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	-	-	-
Comment:					
Public Health Plan	No	-	-	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.4-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Construction Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No - Borough is fully developed

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Haledon.

Table 9.4-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning/Zoning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	At the county level
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Use reverse 911 (Nixle), social media, and municipal website
Maintenance program to reduce risk	Yes	Public Works and Recycling – maintains local roads, parks, rights-of-way, and water lines
Mutual aid agreements	Yes	County and surrounding municipalities
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering
Planners or engineers with an understanding of natural hazards	Yes	Engineering
Staff with training in benefit/cost analysis	Yes	Engineering
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyor	Yes	
Stormwater engineer	Yes	Borough Engineer
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes	through the Manchester MUA
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management
Watershed planner	No	-
Environmental specialist	Yes	Borough Engineer
Grant writers	Yes	Millennium Strategies
Resilience Officer	No	
Other	No	

Fiscal Capability

The table below summarizes financial resources available to the Borough of Haledon.

Table 9.4-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Haledon.

Table 9.4-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - PIO for the Police Dept.; for municipal matters, it depends on the type of incident
Do you have personnel skilled or trained in website development?	Yes - contracted out
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes - through Nixle and municipal website
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes - police dept. but for informational purposes only
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes – municipal website and newsletter
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - reverse 911 (Nixle), social media, and municipal website are all used to relay emergency messages to Borough residents

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Haledon.

Table 9.4-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	4	09/16/13

Program	Participating?	Classification	Date Classified
Public Protection (Fire ISO Protection Class)	Yes	5	06/30/14
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	No
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	*Yes*

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	Medium

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.4-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Office
Who is your floodplain administrator? (name, department/position)	Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No

Criterion	Response
What is the date that your flood damage prevention ordinance was last amended?	December 27, 2007
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Overall, meets the minimum; however, it does not meet the minimum state requirement for new development and substantial improvements in the floodplain which requires a minimum of one foot above the base flood elevation. Refer to 2020-HALEDON-003
When was the most recent Community Assistance Visit or Community Assistance Contact?	N/A
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? • If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No, but has considered joining it
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	9 policies in force $3,370,000 insurance in-force $8,453 premium in-force
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	38 claims 16 claims closed without payment $151,278 in total payments
Do you maintain a list of properties that have been damaged by flooding?	The Borough does not maintain lists/inventories of properties that have been damaged by floods.
Do you maintain a list of property owners interested in flood mitigation?	There are currently no properties interested in mitigation.

**According to FEMA statistics as of 2018*

ADDITIONAL AREAS OF EXISTING INTEGRATION

- Borough of Haledon Department of Public Works – The Department of Public Works is responsible for the maintenance of all local roads, parks, rights-of-way, and water lines. The Department provides information on their website (https://www.haledonboronj.com/public-works-recycling) on how residents can reduce pollution and runoff. They provide links to the Borough's Stormwater Pollution Prevention Management Plan and their Stormwater Management Plan.
- **Stormwater Management Plan (2005):** The Borough's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. The Plan provides proposed changes to the Borough's Master Plan and ordinances that will aid in mitigated the impacts of stormwater runoff from redevelopments and new developments. For developments that cannot accommodate for the specific design and performance standards, general mitigation project types are provided to be implemented in place of on-site management.

- **Ordinances:** The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of Haledon website at http://www.haledonboronj.com/ for further information.
- **Outreach:** The Borough publishes articles on their homepage that inform residents of any current events, infrastructure maintenance or public health events that are occurring. The website has a page for the Office of Emergency Management, which publishes emergency preparedness tips and FEMA's Hurricane Preparedness guide. The OEM page also gives instructions on how to sign-up for the Emergency Alert System.
- **Funding:** The Borough does not have capital funding; however, the Borough is in the process of receiving mitigation grant funding for generators. The Borough is still waiting for final award announcement for this project.

9.4.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Haledon's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.4-10 provides details regarding municipal-specific loss and damages the Borough of Haledon experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.4-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed.	
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County.	
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Downed trees, roads closed, borough staff overtime

9.4.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.4-11 summarizes the Borough risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to

each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.4-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	8,440	100-year MRP Hurricane:	1,809	100-year MRP Hurricane:	$348,148	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	0	NEHRP D&E:	0	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	417	Liquefaction Class 4:	97	500-year MRP building damages/loss:	$982,569	
						2,500-year MRP building damages/loss:	$16,324,058	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,044	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	1,097			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	4	1% annual chance	2	1% annual chance	$470,875	High
		0.2% annual chance	151	0.2% annual chance	44			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	230	Class A:	56	Class A:	$6,705,942	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	4	Replacement cost value of buildings located in the hazard area:	$0	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Haledon.

- Number of repetitive loss (RL) properties: 1 (see 2020-HALEDON-002 in Table 9.4-15)
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain and presents HAZUS-MH estimates of the damage and loss of use to critical facilities as a result of a 1-percent annual chance flood event.

Table 9.4-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
None identified				

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- Henry Street is a county-owned road in the Borough that has drainage issues which leads to flooding. Since the Borough does not own this road, they cannot complete projects to help alleviate this problem.
- The area around the bridge on Church Street will flood during periods of heavy rain.
- The storm sewer system on Belmont Avenue becomes overwhelmed during heavy rain events.
- Areas in the Borough near the rivers and streams will become inundated during periods of heavy rain.
- Water quantity problems exist throughout the Borough and include flooding and stream bank erosion. The intersection of Cliff and Oxford Streets contain an undersized drainage system and the area routinely floods during heavy rain storms (Boswell McClave Engineering 2005).

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Haledon that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Haledon has significant exposure. Refer to Figures 9.4-1 and 9.4-2 later in this annex.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The

ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Haledon. The Borough of Haledon has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough of Haledon was in agreement with the calculated hazard rankings for the municipality.

Table 9.4-13. Borough of Haledon Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Low	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Medium	Medium	Medium	Low

9.4.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.4-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: 1. Generator for Borough Town Hall 2. Haledon Fire Company 1 (Pompton Road) 3. Haledon Fire Company 2 (West Broadway)	Borough of Haledon	In Progress / No Progress	Yes	2020-HALEDON-001

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. There are 8 properties on Henry Street that have been identified for flood-proofing at this time. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	No Progress	Discontinue	-
Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance.	Elected Official's Office	Ongoing Capability	-	-
Public Warning/Alert System throughout the Borough	OEM	Complete	-	-
Floodproof eight (8) flood-prone properties located on Henry Street	Borough of Haledon	No Progress	Discontinue	-

In addition to the projects completed above, the Borough has completed:

- Molly Ann flood control project was completed and fixed a lot of flood-related problems in the Borough.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Haledon participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Haledon participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.4-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Haledon would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the 4 FEMA mitigation action categories and the 6 CRS mitigation

action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.4-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-HALEDON-001	Backup Power for Critical Facilities	**Problem**: Three critical facilities in the Borough do not have backup power and cannot function properly during a power outage. **Solution**: Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: 1. Generator for Borough Town Hall 2. Haledon Fire Company 1 (Pompton Road) 3. Haledon Fire Company 2 (West Broadway)	Existing	Coastal Storm, Dam Failure, Disease Outbreak, Earthquake, Extreme Temperature, Flood, Geological, Severe Weather, Severe Winter Weather, Wildfire	1, 2, 6	Borough OEM, Borough Engineer, Borough Fire Department	FEMA HMGP and FMA	Continuity of operations	$100,000+	Within 3 years	High	SIP	PP, ES
2020-HALEDON-002	Repetitive Loss Properties	**Problem**: There is one repetitive loss property in the Borough. Frequent flooding has resulted in damages to this structure as documented by paid NFIP claims **Solution**: Conduct outreach to the property owner and provide information on mitigation alternatives including elevation, acquisition, and floodproofing the structure. If the homeowner chooses elevation or acquisition, the Borough will develop a FEMA grant application to obtain funding to implement the project.	Existing	Flood	1, 2	Floodplain Administrator, Homeowner	Borough Budget for outreach, FEMA FMA or HMGP depending on mitigation solution identified	Increases awareness in community, reduces flood damage	<$10,000 for outreach; $100,000+ for acquisition or elevation	Within 3 years	Medium	LPR	PR, PI
2020-HALEDON-003	Update Flood Damage Prevention Ordinance	**Problem**: The current flood damage prevention ordinance (Chapter 191) states that any new development or substantial improvements must be	New and Existing	Flood	All	Borough Administration	City Budget	Increase protection of development in the floodplain	<$10,000	Within 1 year	High	LPR	PR, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		elevated at or above the base flood elevation. This does not meet the minimum requirement set by the State of New Jersey. **Solution**: Update the current flood damage prevention ordinance to require new construction and substantial improvements to be elevated at least one foot above the base flood elevation.											
2020-HALEDON-004	Feasibility Study in the Church Street, Haledon Avenue, and North 16th Street areas	**Problem:** The bridge on Church Street, Haledon Avenue, and North 16th Street are all floodprone areas in the Borough. These areas flood during periods of heavy rain. At this time, the Borough needs to understand the best solutions to alleviate this problem. **Solution:** Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on Church Street, Haledon Avenue, and North 16th Street.	Existing	Coastal Storm, Flood, Severe Weather	1, 2, 6	Borough Engineer, Borough DPW	FEMA FMA, Borough Budget	Provides information on what projects can be completed; raises awareness; increase knowledge of area	$75,000	Within 5 years	Medium	LPR	PR
2020-HALEDON-005	Feasibility Study at the intersection of Cliff and Oxford Streets	**Problem:** Water quantity problems exist throughout the Borough and include flooding and stream bank erosion. The intersection of Cliff and Oxford Streets contain an undersized drainage system and the	Existing	Coastal Storm, Flood, Severe Weather	1, 2, 6	Borough Engineer, Borough DPW	FEMA FMA, Borough Budget	Provides information on what projects can be completed; raises awareness;	$75,000	Within 5 years	Medium	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		area routinely floods during heavy rain storms. **Solution:** Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on the intersection of Cliff and Oxford Streets.						increase knowledge of area					
2020-HALEDON-006	Feasibility Study of Cona Court, Bernard Ave, and North 12th and 13 Streets	**Problem:** The area of Cona Court, Bernard Ave, and North 12th and 13 Streets experience flooding during heavy rain events. On Cona Court, sewage backups occur as well. **Solution:** Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on Cona Court, Bernard Ave, and North 12th and 13 Streets.	Existing	Coastal Storm, Flood, Severe Weather	1, 2, 6	Borough Engineer, Borough DPW	FEMA FMA, Borough Budget	Provides information on what projects can be completed; raises awareness; increase knowledge of area	$75,000	Within 5 years	Medium	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*

- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.4-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-HALEDON-001	Backup Power for Critical Facilities	1	1	1	1	0	1	0	1	1	1	1	1	1	1	12	High
2020-HALEDON-002	Repetitive Loss Properties	1	1	1	1	0	0	1	0	1	1	0	1	0	0	8	Medium
2020-HALEDON-003	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	1	1	1	0	1	0	0	11	High
2020-HALEDON-004	Feasibility Study in the Church Street, Haledon Avenue, and North 16th Street areas	1	1	1	1	0	1	0	0	0	1	1	1	0	0	8	Medium
2020-HALEDON-005	Feasibility Study in the Church Street area	1	1	1	1	0	1	0	0	0	1	1	1	0	0	8	Medium
2020-HALEDON-006	Feasibility Study of Cona Court, Bernard Ave, and North 12th and 13 Streets	1	1	1	1	0	1	0	0	0	1	1	1	0	0	8	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.4-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storm	-004, -005	-001			-001	-001		
Dam Failure		-001			-001	-001		
Disease Outbreak		-001			-001	-001		
Drought		-001			-001	-001		
Earthquake		-001			-001	-001		
Extreme Temperature		-001			-001	-001		
Flood	-002, -003, -004, -005	-001, -003	-002		-001	-001		
Geological Hazard		-001			-001	-001		
Hazardous Substances		-001			-001	-001		
Infestation and Invasive Species								
Severe Weather	-004, -005	-001			-001	-001		
Severe Winter Weather		-001			-001	-001		
Wildfire		-001			-001	-001		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.4.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Haledon followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.4-18. Contributors to the Annex

Entity	Title	Method of Participation
Mounir Almaita	OEM Coordinator	Attended meetings; provide input on the jurisdictional annex
Lt. George Guzman	Deputy OEM Coordinator	Attended meetings; provided input throughout the planning process; identified mitigation strategies
Phil Cheff	Construction Official	Attended meetings; provide input on the jurisdictional annex
Domenick Stampone	Mayor	Reviewed the annex
David Atkinson	Land Use Planner and Engineer	Reviewed the annex

Entity	Title	Method of Participation
Steve Sanzari	Fiscal/CFO	Reviewed the annex
Anthony Harrington	Public Works Foreman	Reviewed the annex
Angelo J. Daniele	Police Chief	Reviewed the annex
Tom Bakker	Fire Chief	Reviewed the annex

Figure 9.4-1. Borough of Haledon Hazard Area Extent and Location Map 1

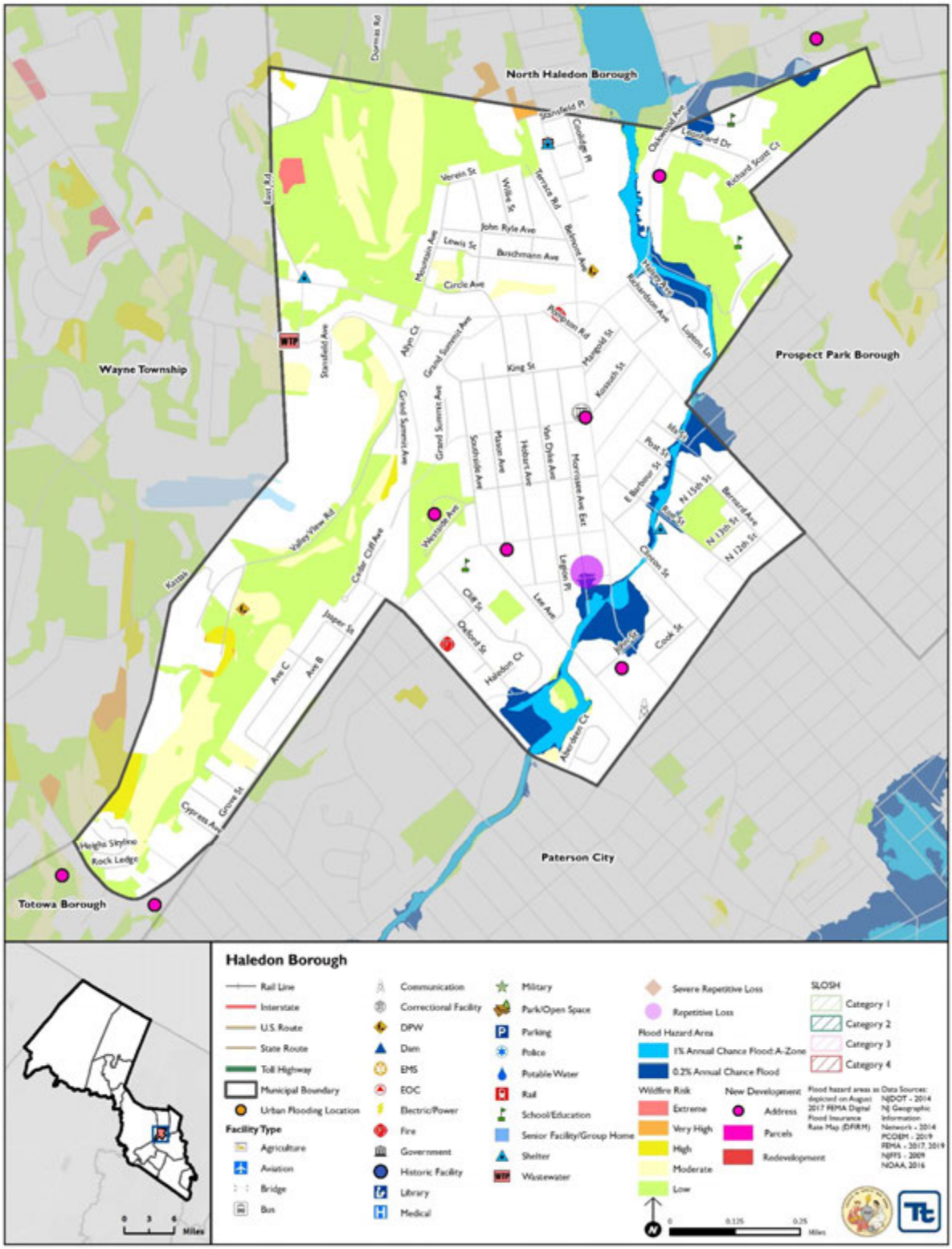
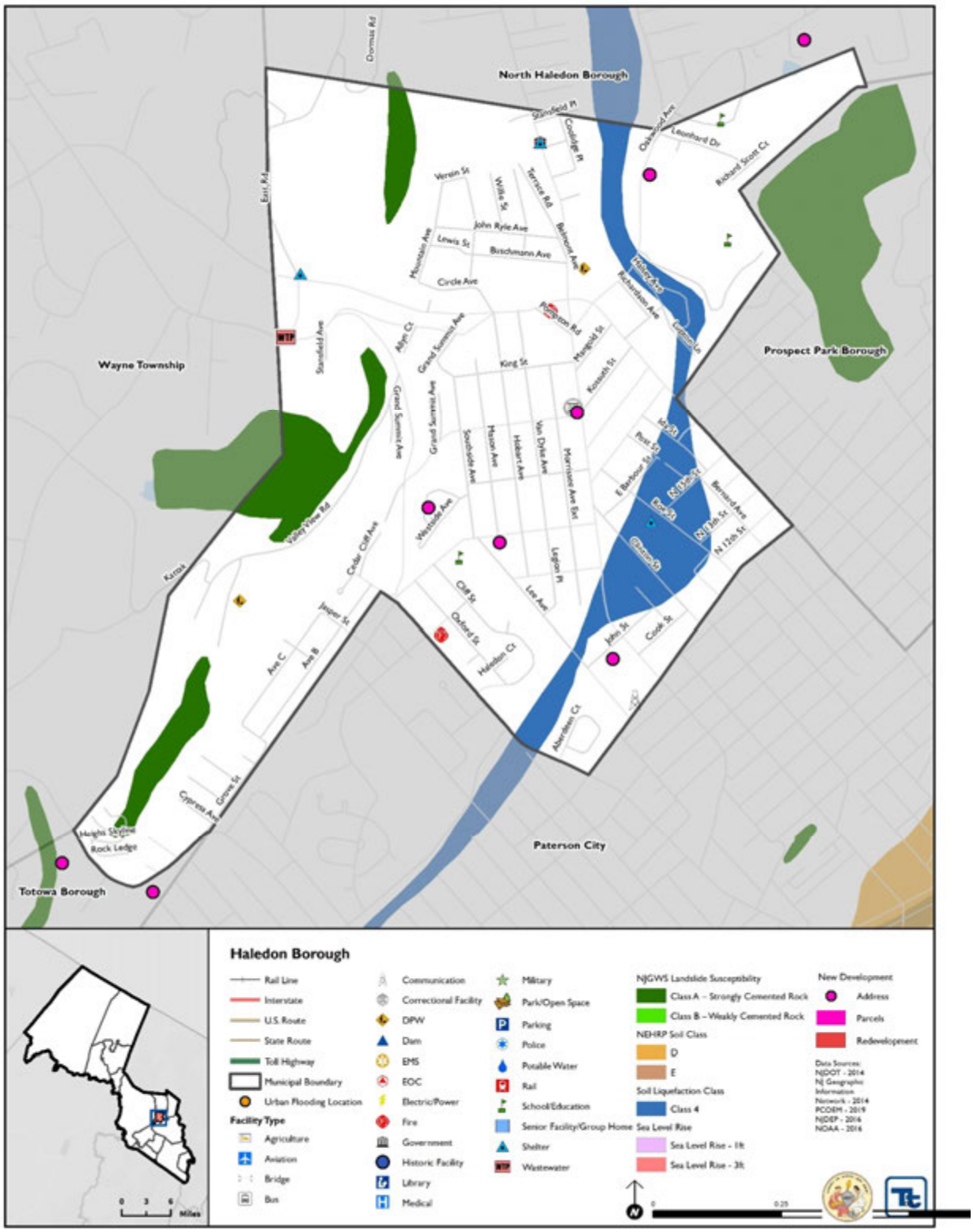


Figure 9.4-2. Borough of Haledon Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Backup Power for Critical Facilities		
Project Number:	2020-HALEDON-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	Several critical facilities in the Borough do not have backup power. During a power outage, the facilities cannot fully operate and provide the essential services to the community.		
Action or Project Intended for Implementation			
Description of the Solution:	Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: 1. Generator for Borough Town Hall 2. Haledon Fire Company 1 (Pompton Road) 3. Haledon Fire Company 2 (West Broadway)		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations
Useful Life:	15 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$100,000+	**Mitigation Action Type:**	Structure and Infrastructure Project (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	With 3 years
Estimated Time Required for Project Implementation:	With 3 years	**Potential Funding Sources:**	FEMA HMGP and FMA
Responsible Organization:	Borough OEM, Borough Engineer, Borough Fire Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels at each facility	$35,000+	Costly, weather dependent, building property does not have the capacity for solar panel installation
	Install wind turbines	$10,000+	Costly, weather dependent, requires open space

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Power for Critical Facilities	
Project Number:	2020-HALEDON-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Allow critical facilities to remain open and provide essential services to the community
Property Protection	1	Allow buildings to properly function during power outages
Cost-Effectiveness	1	Benefits outweigh the costs – continuity of operations
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to purchase and install backup power at these facilities
Fiscal	0	The Borough will need grant funding to complete the project
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	To be completed within two years once funds are received
Agency Champion	1	
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Feasibility Study in the Church Street, Haledon Avenue, and North 16th Street areas		
Project Number:	2020-HALEDON-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	The bridge on Church Street, Haledon Avenue, and North 16th Street are all floodprone areas in the Borough. These areas flood during periods of heavy rain. At this time, the Borough needs to understand the best solutions to alleviate this problem.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on Church Street, Haledon Avenue, and North 16th Street.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Provides information on what projects can be completed; raises awareness; increase knowledge of area
Useful Life:	N/A	**Goals Met:**	1, 2, 6
Estimated Cost:	$75,000	**Mitigation Action Type:**	Local Plans and Regulations (LPR)
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	With 5 years
Estimated Time Required for Project Implementation:	With 5 years	**Potential Funding Sources:**	FEMA FMA
Responsible Organization:	Borough Engineer, Borough DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$5 million+	Costly, might not fix the problem, long-term roadway closures
	Acquire properties	$1 million+	Not feasible, costly, loss tax base

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Feasibility Study in the Church Street, Haledon Avenue, and North 16th Street areas	
Project Number:	2020-HALEDON-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides understanding on next steps to protect lives
Property Protection	1	Provides understanding on next steps to protect buildings
Cost-Effectiveness	1	Benefits outweigh the costs - provides information on what projects can be completed; raises awareness; increase knowledge of area
Technical	1	
Political	0	
Legal	1	
Fiscal	0	Need funding to complete study
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Coastal Storm, Flood, Severe Weather
Timeline	1	To be completed within five years once funding is received
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Feasibility Study at the intersection of Cliff and Oxford Streets		
Project Number:	2020-HALEDON-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	Water quantity problems exist throughout the Borough and include flooding and stream bank erosion. The intersection of Cliff and Oxford Streets contain an undersized drainage system and the area routinely floods during heavy rain storms.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on the intersection of Cliff and Oxford Streets.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Provides information on what projects can be completed; raises awareness; increase knowledge of area
Useful Life:	N/A	**Goals Met:**	1, 2, 6
Estimated Cost:	$75,000	**Mitigation Action Type:**	Local Plans and Regulations (LPR)
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	With 5 years
Estimated Time Required for Project Implementation:	With 5 years	**Potential Funding Sources:**	FEMA FMA
Responsible Organization:	Borough Engineer, Borough DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$5 million+	Costly, might not fix the problem, long-term roadway closures
	Acquire properties	$1 million+	Not feasible, costly, loss tax base

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Feasibility Study at the intersection of Cliff and Oxford Streets	
Project Number:	2020-HALEDON-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides understanding on next steps to protect lives
Property Protection	1	Provides understanding on next steps to protect buildings
Cost-Effectiveness	1	Benefits outweigh the costs - provides information on what projects can be completed; raises awareness; increase knowledge of area
Technical	1	
Political	0	
Legal	1	
Fiscal	0	Need funding to complete study
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Coastal Storm, Flood, Severe Weather
Timeline	1	To be completed within five years once funding is received
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Feasibility Study of Cona Court, Bernard Ave, and North 12th and 13 Streets		
Project Number:	2020-HALEDON-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	The area of Cona Court, Bernard Ave, and North 12th and 13 Streets experience flooding during heavy rain events. On Cona Court, sewage backups occur as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to investigate improvements in these areas that will help minimize roadway closures and damages due to flood events. The study will focus on Cona Court, Bernard Ave, and North 12th and 13 Streets.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Provides information on what projects can be completed; raises awareness; increase knowledge of area
Useful Life:	N/A	**Goals Met:**	1, 2, 6
Estimated Cost:	$75,000	**Mitigation Action Type:**	Local Plans and Regulations (LPR)
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	With 5 years
Estimated Time Required for Project Implementation:	With 5 years	**Potential Funding Sources:**	FEMA FMA
Responsible Organization:	Borough Engineer, Borough DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$5 million+	Costly, might not fix the problem, long-term roadway closures
	Acquire properties	$1 million+	Not feasible, costly, loss tax base

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Feasibility Study of Cona Court, Bernard Ave, and North 12th and 13 Streets	
Project Number:	2020-HALEDON-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides understanding on next steps to protect lives
Property Protection	1	Provides understanding on next steps to protect buildings
Cost-Effectiveness	1	Benefits outweigh the costs - provides information on what projects can be completed; raises awareness; increase knowledge of area
Technical	1	
Political	0	
Legal	1	
Fiscal	0	Need funding to complete study
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Coastal Storm, Flood, Severe Weather
Timeline	1	To be completed within five years once funding is received
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

9.5 BOROUGH OF HAWTHORNE

This section presents the jurisdictional annex for the Borough of Hawthorne. The annex includes a general overview of the Borough; an assessment of the Borough of Hawthorne's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.5.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Hawthorne's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.5-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Richard McAuliffe, OEM Coordinator 445 Lafayette Ave., Hawthorne, NJ 973-427-1800 rmcauliffe@hawthornepdnj.org	Brian Vanderhook, Deputy OEM Coordinator 445 Lafayette Ave., Hawthorne, NJ 973-427-1800 bvanderhook@hawthornepdnj.org
NFIP Floodplain Administrator	
Richard Stewen, Building Official 445 Lafayette Ave., Hawthorne, NJ 973-304-2058 rstewen@hawthornenj.org	

9.5.2 Jurisdiction Profile

Once inhabited by the Lenni-Lenape Indians, also known as the Delaware, Hawthorne was settled in the 1700s by Dutch immigrants who were to become the borough's pioneer farmers. This settlement was first part of Manchester Township, a region that was later separated into Hawthorne, Haledon, North Haledon, Prospect Park, Totowa and most of the First Ward of Paterson. The municipality was incorporated by an act of the New Jersey Legislature on March 24, 1898.

Since 1990, the Borough of Hawthorne has operated under a Mayor – Council form of government, as authorized by the State of New Jersey's Faulkner Act with a charter approved by the local voters. Under this form of government, similar in concept to our federal government, the Mayor and the Council are two separate but co-equal power centers. The mayor serves as Chief Executive of the Borough who is responsible for supervising the operations of government and seeing that the laws are enforced, while the Borough Council serves as the Borough's legislative body, passing local ordinances and resolutions.

According to the U.S. Census Bureau, the Borough has a total land area of 3.364 square miles, of which 3.334 square miles is land and 0.03 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Hawthorne was 18,791. The estimated 2017 population was 19,065, a 1.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.9 percent of the population is 5 years of age or younger and 15 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.5.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.5-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.5-1 and 9.5-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.5-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	0	2	2	1	0
Multi-Family	0	0	0	19	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Hawthorne Square	Residential	12 buildings	175 Forest Ave.	No known hazards at this time	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Rivergate of Hawthorne	Mixed Use	219 apartments	204 Wagaraw Road	0.2 % Flood Zone, NEHRP D class soils	In Progress

** Only location-specific hazard zones or vulnerabilities identified.*

9.5.4 Capability Assessment

The Borough of Hawthorne performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment below. The Borough of Hawthorne identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Hawthorne.

Table 9.5-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State &Local	Yes	Yes	-
Comment: *Chapter 185 (Uniform Construction Codes); enforced by the Hawthorne Building Department. The department is capable of implementing the code and all municipal codes within its authority to insure new development meets safety codes to protect the public against natural and manmade disasters. This chapter has been integrated into other municipal codes including Land Use Procedures, Property Maintenance, Subdivision of Land, and Zoning.*					
Zoning Code	Yes	Local	Yes	Yes	-
Comment: *Chapter 540 (Zoning) - adopted by the municipal council on 1/17/1979; an application for a building permit for a proposed R-1 or R-2 residential use on land lying within Zone A, Special Flood Hazard Area, as shown on the current Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary Maps 10 for the Borough of Hawthorne, shall be first reviewed by the Planning Board under the provisions of Article IV of this chapter, and all standards, procedures and requirements therein set forth shall be complied with to the extent applicable to construction or other improvements in a floodplain area having special flood hazards. The Planning Board shall review and consider such applications to determine that such proposal for: (1) Major repairs: (a) Uses construction materials and utility equipment that are resistant to flood damage. (b) Uses construction methods and practices that will minimize flood damage. (2) New construction or substantial improvements: (a) Is protected against flood damage. (b) Is designed (or modified) and anchored to prevent flotation, collapse or lateral movement of the structure. (c) Uses construction materials and utility equipment that are resistant to flood damage. (d) Uses construction methods and practices that will minimize Flood Damage.*					
Subdivisions	No	Local	Yes	Yes	-
Comment: *Chapter 450 (Subdivision of Land) - adopted by the municipal council on 9/4/1963; any owner of land within the Borough of Hawthorne shall, prior to subdividing or re-subdividing land as defined in the chapter, must submit to the Zoning Administrator at least two weeks prior to a regular meeting of the Board for consideration at the work session of the Board. All subdivision proposals shall be reviewed for assurance that: all such proposals are consistent with the need to minimize flood damage; all public utilities and facilities, such as sewer, gas, electrical and water systems, are located, elevated and constructed to minimize or eliminate flood damages; and adequate drainage is provided so as to reduce exposure to flood hazards.*					
Stormwater Management	Yes	local	Yes	Yes	-
Comment: • *Chapter 432 (Storm Sewers) – last amended on 8/1/2012; the Code Enforcement Officer enforces this code. The code prohibits discharge or cause to be discharged through an illicit connection to the municipal separate storm sewer system operated by the Borough of Hawthorne any domestic sewage, noncontact cooling water, process wastewater, or other individual waste (other than stormwater). Other Borough codes reference this chapter including: Building, Flood Damage Prevention, Sewers and Sewage Disposal, Stormwater Management, Streets and Sidewalks, Subdivision of Land, and Zoning.* • *Chapter 437 (Stormwater Management) - adopted by the municipal council on 4/5/2006; Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in § 437-4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with § 437-10.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State	Yes	Yes	-
Comment: *Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes	-	-
Comment: *Part of the Zoning Code (Chapter 540) that serves to guide and regulate the orderly growth and development of the Borough.*					
Site Plan Review	Yes	Local	Yes	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Part of the Zoning Ordinance (Chapter 540); reviewed and approved by the Planning Board. A site plan is required to be presented to the Construction Official before building permits are issued. When reviewing building permit applications for construction, improvement, or major repairs in the SFHA, the Planning Board reviews the site plans for:* *Major Repairs - Uses construction materials and utility equipment that are resistant to flood damage; uses construction methods and practices that will minimize flood damage* *New construction or substantial improvements - Is protected against flood damage; Is designed (or modified) and anchored to prevent flotation, collapse or lateral movement of the structure; uses construction materials and utility equipment that are resistant to flood damage; uses construction methods and practices that will minimize flood damage.*					
Environmental Protection	No	-	-	-	-
Comment:					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
Comment: *Chapter 247 (Flood Damage Prevention); adopted by the municipal council on 9/5/2007; Construction Official is the designated floodplain administrator. A development permit shall be obtained before construction or development begins within any area of special flood hazard established in § 247-7. Application for a development permit shall be made on forms furnished by the Construction Official. The Official shall Review all development permits to determine if the proposed development is located in the floodway and assure that the encroachment provisions of § 247-18A are met. The Construction Official shall obtain and record the actual elevation, in relation to mean sea level, of the lowest habitable floor, including basement, of all new or substantially improved structures and whether or not the structure contains a basement. In passing upon variance applications, the Planning Board shall consider all technical evaluations, all relevant factors, standards specified in other sections of this chapter and:* *(a) The danger that materials may be swept onto other lands to the injury of other.* *(b) The danger to life and property due to flooding or erosion damage.* *(c) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.* *(d) The importance of the services provided by the proposed facility to the community.* *(e) The necessity to the facility of a waterfront location, where applicable.* *(f) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage.* *(g) The compatibility of the proposed use with existing and anticipated development.* *(h) The relationship of the proposed use to the Comprehensive Plan and floodplain management program of that area.* *(i) The safety of access to the property in times of flood for ordinary and emergency vehicles.* *(j) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site.* *(k) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities, such as sewer, gas, electrical and water systems and streets and bridges.*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	Yes	Local	No	-	-
Comment: • ***Chapter 293 (Land Use Procedures)*** *– last amended on July 9, 2014. This chapter was established by the Planning and Zoning Boards and set up procedures by which they review and can approve applications for development. The Boards approve or deny applications for development and require compliance with the applicable Borough ordinances put in place to protect the Borough from the possible detrimental impacts of development projects. This chapter has been integrated into other municipal codes include Zoning, Subdivision of Land, Storm Sewers, and Stormwater Management.* • ***Chapter 350 (Parks and Recreation)*** *– Through enforcement by the Borough, this chapter protects developed and undeveloped public recreation areas from degradation. This chapter states that no person or entity shall utilize any public recreation area without first obtaining a permit, license, or pass. This chapter is integrated into other codes including Streets and Sidewalks, Subdivision of Land, and Zoning.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
• ***Chapter 399 (Sewers and Sewage Disposal)*** *– last amended on March 6, 2019. The chapter states that no unauthorized person shall uncover, make any connections with nor opening into, use, alter or disturb any public sewer or appurtenance thereof without first obtaining a permit from the appropriate municipal official. No person shall make connection of roof downspouts, foundation drains, areaway drains or other sources of surface runoff or groundwater to a building sewer, which in turn is connected directly or indirectly to a public sanitary sewer, unless approved by the municipality for purposes of disposal of polluted surface drainage. The Borough put in place special discharge requirements for industrial and commercial waste. It shall be unlawful to discharge into any natural outlet within the municipality any wastewater or other polluted waters, except where suitable treatment has been provided and where a National Pollutant Discharge Elimination System permit has been obtained from the appropriate governmental authority, where required.* • ***Chapter 488 (Tree Removal)*** *– this chapter states that no property owner shall remove or destroy or cause to be removed or destroyed by any person any tree on any unimproved or vacant tract of land or partially improved tract of land as defined above, within the Borough, unless a permit is obtained for such removal. The Planning Board or Zoning Board shall refer all applications to the Shade Tree Commission for their examination and opinion. A permit shall be granted if there is a finding that the removal and destruction of a tree or trees will not impair the growth and development of remaining trees on the property of the applicant or adjacent properties and would not cause erosion of soil, impair existing drainage, lessen property values in the neighborhood or impair the aesthetic value of the area.* • ***Chapter 491 (Shade Trees)*** *- This chapter may be enforced by the members of the Commission, the Code Enforcement Officer, the Arborist and members of the Police Department. It shall be the duty of the Shade Tree Commission, subject to its review and approval, which shall be subject to the sole discretion of the Shade Tree Commission, from time to time, to plant trees and other plantings in those areas which are subject to the jurisdiction of the Shade Tree Commission. This chapter shows a commitment to planting and saving shade trees, which has benefits such as preventing soil erosion, assisting in drainage, removing carbon dioxide, providing habitat, and shade.*					
Planning Documents					
Comprehensive / Master Plan	Yes, Reexamination August 16, 2011	Local	Yes	Yes	-
Comment: *Periodic Reexamination of the Master Plan and Land Use Plan (adopted August 16, 2011). The Master Plan incorporates the State Plan, RSIS, and the Passaic County Master Plan.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	-	-	-
Comment:					
Floodplain or Watershed Plan	No	-	-	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	-	-
Comment:					
Stormwater Pollution Prevention Plan	Yes	Local and NJDEP	Yes	Yes	-
Comment: *The Borough has stormwater pollution prevention information available on their website. The information includes limiting fertilizer and pesticides, how to properly store and discard hazardous products, keeping pollution out of storm drains, cleaning up after pets, don't litter, disposing yard waste properly, and don't feed wildlife.*					
Urban Water Management Plan	No	-	-	-	-
Comment:					
Habitat Conservation Plan	Yes	Local	No	-	-
Comment: *Environmental Resource Inventory (November 2010) – this plan is used by the Environmental Commission to provide environmental comments to proposed development in the Borough. The plan includes information on land resources, air resources, biological resources, hydrology, and natural resource use.*					
Economic Development Plan	No	-	-	-	-
Comment:					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	No	-	-	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					
Community Forest Management Plan	Yes	Local	No	No	No
Comment: *2012-2016 Community Forestry Management Plan. The purpose of this plan is to improve the quality of life in the Borough of Hawthorne by maximizing the environmental, social and economic benefits of trees to the community while minimizing their costs and liabilities. Relevant goals 1. Maximize long-term stability and sustainability in the public tree population. 2. Situate and maintain public interest, appreciation and support for the Borough's Shade Tree Program and encourage volunteer participation. 3. Encourage environmental stewardship and the planting and proper care of trees on private property.*					
Transportation Plan	No	-	-	-	-
Comment:					
Agriculture Plan	No	-	-	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	Yes	Local	-	-	-
Comment: • *Land Use and Open Space - part of the Borough's Environmental Resource Inventory* • *Open Space Plan* • *Emergency Response Plan – 9/13/13* • *Environmental Resource Inventory* • *Housing Element and Fair Share Plan – 3/5/2009*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	-	-
Comment*: OEM is responsible for updating and maintaining the EOP. The EOP was last updated in 2020.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	-	-	-
Comment:					
Continuity of Operations Plan	Yes	Local	No	-	-
Comment: *Incorporated into the EOP*					
Public Health Plan	Yes	Local - City of Paterson	No	-	-
Comment: *City of Paterson performs Health Department duties and maintains the Public Health Plan*					
Other	No	-	-	-	-
Comment:					

Table 9.5-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes – Building Department is responsible for issuing development permits in the Borough
Does your jurisdiction have the ability to track permits by hazard area?	No

Criterion	Response
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Hawthorne.

Table 9.5-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Hawthorne Planning Board - responsible for review and approval of applications for site development and subdivision of property, for approval of a Master Plan or changes to the Master Plan, reporting on a periodic review of the Master Plan, reviewing and approving applications for certificate of compliance for commercial properties, and advising the Council on changes to the Zoning Ordinance.
Mitigation Planning Committee	Yes	OEM and LEPC
Environmental Board / Commission	Yes	Hawthorne Environmental Commission; Hawthorne Green Team; Shade Tree Commission
Open Space Board / Committee	No	
Economic Development Commission / Committee	Yes	Hawthorne Economic Development Committee - focuses on retention and expansion of existing businesses, as well as attracting new businesses and community development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	The Hawthorne Office of Emergency Management (OEM) coordinates emergency communications during public emergencies or any other time the public requires mass notification to its residents or subscribers through the use of the Hawthorne Emergency Alert System (emergency alert siren, radio station, cable tv, and reverse 911). The Borough also uses he Nixle system for email and text message alerts to the community and publicizes the signup process for residents.
Maintenance program to reduce risk	Yes	The DPW performs storm drain cleaning and tree trimming. This helps reduce damages during and after storm events. There are many county and state roads in the Borough. If an area needs to be clear of debris, the Borough informs the state or county.
Mutual aid agreements	Yes	The Borough has mutual aid agreements with surrounding neighborhoods and with the County. This helps the Borough get the proper equipment and assistance during an event.
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning Board and Town Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Town Engineer, Construction Official, Building Inspector
Planners or engineers with an understanding of natural hazards	Yes	Planning Board and Town Engineer
Staff with training in benefit/cost analysis	Yes	Boswell Engineering
Staff with training in green infrastructure	Yes	Green Team, Environmental Committee
Staff with education/knowledge/training in low impact development	Yes	Boswell Engineering

Staff/Personnel Resource	Available?	Department/Agency/Position
Surveyor	Yes	Boswell Engineering
Stormwater engineer	Yes	Boswell Engineering
Personnel skilled or trained in GIS applications	Yes	Boswell Engineering
Local or state water quality professional	Yes	Boswell Engineering
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Boswell Engineering
Watershed planner	Yes	Boswell Engineering
Environmental specialist	Yes	Boswell Engineering
Grant writers	Yes	-
Resilience Officer	Yes	Boswell Engineering
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of Hawthorne.

Table 9.5-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	Yes, Water
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Hawthorne.

Table 9.5-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - every department in the Borough has their own PIO, depends on the incident
Do you have personnel skilled or trained in website development?	Yes - Borough run and maintained
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes – the municipal website and the OEM webpage provide hazard-related information. This includes public announcements, providing information on preparing for a disaster, links to FEMA flood maps, and encourages residents to sign up for the Borough's emergency alert system.

Criterion	Response
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes - Police Dept Facebook, Instagram, and twitter, local TV station (changes with the season/weather event)
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes - Hawthorne Community Emergency Response Team (CERT). Through this program, residents are trained on dealing with terrorism, disaster preparedness, disaster psychology, fire suppression, medical emergencies, sear and rescue, and team organization.
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes, Borough website & Nixle
Do you have any established warning systems for hazard events? • If yes, briefly describe.	The Hawthorne Office of Emergency Management (OEM) coordinates emergency communications during public emergencies or any other time the public requires mass notification to its residents or subscribers through the use of the Hawthorne Emergency Alert System (emergency alert siren, radio station, cable tv, and reverse 911). The Borough also uses he Nixle system for email and text message alerts to the community and publicizes the signup process for residents.

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Hawthorne.

Table 9.5-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	3	August 2016
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Silver	10/28/2019

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	No
Is the administrative supportive of integrating climate change in policies or actions?	No
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.5-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	September 5, 2007
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	Overall, meets the minimum; however, it does not meet the minimum state requirement for new development and substantial improvements in the floodplain which requires a minimum of one foot above the base flood elevation. Refer to 2020-HAWTHORNE-005
When was the most recent Community Assistance Visit or Community Assistance Contact?	N/A
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No, but the Borough is interested in joining
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	58 policies in force $16,829,600 insurance in force $128,554 premiums in force

Criterion	Response
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	288 claims filed totaling $3,936,162; 50 claims closed without payment
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of September 30, 2018*

Additional Areas of Existing Integration

- **Master Plan Reexamination Report (2011):** The Plan recognizes the State's Planning priority to reclaim environmentally damaged sites and mitigate impacts on remaining environmental and natural resources, including wildlife habitats. Special emphasis should be on air quality, preservation of historic sites, the provision of open space and recreation. Some noteworthy goals specific to the Master Plan include: to encourage buffer zones to separate incompatible land uses; to ensure that any prospective development is responsive to the Borough's environmental features, and can be accommodated while preserving these physical characteristics; to promote the redevelopment and adaptive re-use of former industrial buildings and sites; to promote the use of mass transit; and to adopt a stormwater management plan consistent with the regulations of the NJ DEP and the NJ MLUL, in order to adequately address stormwater runoff impacts from development.
- **Ordinances:** The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of Hawthorne website at http://www.hawthornenj.org/index.cfm for further information.
    - The Borough has enforced a parking ordinance for weather events, mainly snowstorms.
- **Outreach:** The Borough's website has a link to register for Hawthorne Nixle, its community notification system. Residents can receive messages pertaining to emergency situations, community events, and local government meetings, hearings and ordinances. There is general information for residents and senior citizens, as well as businesses. The Borough is a member of Sustainable Jersey and has information regarding their progress for the program on the website.
- **Floodgates:** The Borough has floodgates near the river on Wagaraw Road.
- **Environmental Commission:** The Hawthorne Environmental Commission was established in November 1998. They created a Green Map which encourages people to walk through the Community. These routes would serve to boost physical activity, build community, and reduce vehicle congestion and air pollution. Increased foot traffic would allow local shop owners, restaurateurs, healthcare professionals, and other entrepreneurs to promote and grow their business. The Green Map icons feature Hawthorne's green living, nature, social, and cultural resources.

    - The Environmental Commission has been able to achieve many accomplishments by protecting and preserving the environment of the Borough of Hawthorne through the following activities:
        - Secured grants to help fund environmental projects, such as 8 Acre Woods in Goffle Brook Park and Green Map
        - Developed an Environmental Resource Inventory that is used to guide Hawthorne on land use decisions
        - Advise municipal planning boards and zoning boards of adjustment about the impacts of development proposals on such issues as flooding and runoff, open space needs, water and air quality, plant and animal habitat and waste disposal

- An Environmental Commissioner seat on the Planning Board to provide recommendations and advice on potential environmental impacts on proposed development
- Monitor upcoming environmental issues and regulations and provide guidance to Municipal Council and Mayor
- Educate and inform residents and students on ways to protect the environment

- **Green Team Committee**: The Green Team is made up of local residents who work with individuals, businesses, schools, and the Borough of Hawthorne to save taxpayers money, provide educational information, protect our natural resources for future generations and to promote the health and well-being of individuals, the community and the environment. Green Team activities compliment those of the Environmental Commission. They implement small sustainable based projects conduct outreach and educate the public to protect the local environment.
- **Vulnerable Population Registry**: The Borough created a list of stakeholders with access to vulnerable residents that can help the town get word out to vulnerable residents. Stakeholders include (homeless shelter/senior center/hospital managers; faith based/civic association leaders, etc.). The list is housed in the office of the OEM and police desk and is accessible only to the members of the Police /OEM because of its confidential nature. They share the information with, emergency services, and other stakeholders such as the local emergency planning group, senior housing and group homes, as needed.

9.5.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Hawthorne's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.5-10 provides details regarding municipal-specific loss and damages the Borough of Hawthorne experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.5-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed.	While the County was impacted by this event, the Borough of Hawthorne did not experience significant damages or losses.
July 1, 2017	Heavy Rain and Flooding	N/A	Scattered showers and thunderstorms developed over Passaic County, bringing heavy rain and flooding along the Preakness Brook.	While the County was impacted by this event, the Borough of Hawthorne did not experience significant damages or losses.
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	While the County was impacted by this event, the Borough of Hawthorne did not experience significant damages or losses.

Notes:

9.5.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.5-11 summarizes the Borough of Hawthorne risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.5-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	19,065	100-year MRP Hurricane:	5,923	100-year MRP Hurricane:	$1,287,750	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	3,749	NEHRP D&E:	1,085	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	4	Liquefaction Class 4:	21	500-year MRP building damages/loss:	$1,890,778	
						2,500-year MRP building damages/loss:	$27,916,813	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,873	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	972			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	151	1% annual chance	81	1% annual chance	$7,599,231	High
		0.2% annual chance	241	0.2% annual chance	222			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	22	Class A:	5	Class A:	$4,137,136	Moderate
		Class B:	82	Class B:	26	Class B:	$20,815,563	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	0	Replacement cost value of buildings located in the hazard area:	$0	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Hawthorne.

- Number of repetitive loss (RL) properties: 17
- Number of severe repetitive loss (SRL) properties: 4
- Number of RL/SRL properties that have been mitigated: Three properties through CDBG-DR funding; however, not reflected in the FEMA list.

Source: FEMA April 2019
Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.5-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Goffle Rd Well 1*	Well	x	x	2020-HAWTHORNE-001
Goffle Rd Well 3*	Well	x	x	2020-HAWTHORNE-001
Goffle Rd Well 6*	Well	x	x	2020-HAWTHORNE-001
Rae Ave Well*	Well	x	x	2020-HAWTHORNE-001
South Wagaraw Well 10*	Well	x	x	2020-HAWTHORNE-001
South Wagaraw Well 12*	Well	x	x	2020-HAWTHORNE-001
South Wagaraw Well 15*	Well	x	x	2020-HAWTHORNE-001
Goffle Brook Park	Park/Open Space	x	x	This park is open space with limited structures; cannot be mitigated
North Water Pumping Station*	Potable Pump	x	x	The Borough has a trailer-size generator to use to power the station in the event of a power outage.

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- Goffle Brook and Deep Brook are the major surface waters in the Borough and part of the Passaic River watershed. Both valleys of these brooks have been eroded and scoured by storm events. Increased development of housing and commercial establishments has contributed to the substantial flooding of Goffle Brook. Erosion, sedimentation, and flooding are serious problems in both brooks. Flooding is a chronic problem in the Borough, especially in the areas of Wagaraw Road, where Goffle Brook enters the Passaic River. Low-lying areas and an inadequate culvert located under the industrial complex north of Wagaraw Road causes flow to escape the banks and pass over Wagaraw Road. Flooding also occurs at the confluence of Deep and Goffle Brooks at the intersection of Goffle and Goffle Hill Roads. There has also been flooding north of Lafayette Avenue, near the intersection of Rock Road, with ensuing damage to commercial and residential properties. North of Route 208, where Goffle Brook is narrow and channelized, flooding problems occur as well (Hawthorne Environmental Resource Inventory; FEMA FIS 2007).

- The stormwater drains cause flooding after heavy rain events. The Borough does not have jurisdiction over the drains and cannot properly clean them. This is a County responsibility.
- Lafayette Avenue and Central Avenue experience nuisance roadway flooding. The side streets in the Borough do not have storm drains so rain flows to this area of the Borough.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Hawthorne that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Hawthorne has significant exposure. Refer to Figures 9.5-1 and 9.5-2 presented later in this annex.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Hawthorne. The Borough of Hawthorne has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Hawthorne adjusted the calculated ranking of Coastal Storm from high to medium due to historic data.

Table 9.5-13. Borough of Hawthorne Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Medium	Low	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Low	Medium	Medium	Medium	Medium	Low

9.5.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.5-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to support continuity of operations during hazard events. Critical facilities identified at this time: 1. Portable Generates for Water Utility	Borough of Hawthorne	Complete	-	-
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Acquisitions identified through CDBG-DR program. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Borough of Hawthorne	Ongoing Capability	-	-
Elevate seven sewer and water pump stations along the Passaic River above the floodplain	Borough of Hawthorne	No Progress	Include in 2020 plan	2020-HAWTHORNE-001
Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance.	Borough of Hawthorne	Ongoing Capability	-	-
Buyout of floodprone properties	Borough of Hawthorne	Complete - acquired three residential homes with Blue Acres (Wygert Rd)	-	-

The Borough of Hawthorne did not identify any additional mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Hawthorne participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Hawthorne participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.5-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Hawthorne would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the 4 FEMA mitigation action categories and the 6 CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A high priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.5-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-HAWTHORNE-001	Elevation of Sewer and Pump Stations	**Problem**: When the Passaic River floods, severe sewer and pump stations are vulnerable to flood impacts. **Solution**: Elevate seven sewer and water pump stations along the Passaic River above the floodplain	Existing	Costal Storm, Flood, Severe Weather, Severe Winter Weather	1, 2	Borough DPW and Administration	FEMA HMGP and FMA	Continuity of operations, protects infrastructure	>$50,000	Within 5 years	High	SIP	PP, ES
2020-HAWTHORNE-002	Road Closure Gates on Wagaraw Road	**Problem**: Wagaraw Road is frequently inundated during heavy rain events; however, the flooding recedes within a couple of hours. In the event the road is flooded, DPW and emergency personal need to go out and close the roads and remain there until waters recede. **Solution**: Install eight gates at Wagaraw Road and appropriate signage. These will be used to close roads when they become inundated. It will provide safety measures for residents and municipal employees. It will reduce overtime, man hours and vehicle hours. It provides a more visible and sturdier barricade to provide safety measures and prevent	Existing	Coastal Storm, Flood, Severe Weather, Severe Winter Weather	1, 2	Borough DPW, Borough Police	Municipal Budget	Increase safety measures	$15,000	Within 5 years	High	SIP	PP, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		cars from entering flooded roadways.											
2020-HAWTHORNE-003	Road Closure Gates on Goffle Road	**Problem**: Goffle Road and North 8th Street are frequently inundated during heavy rain events; however, the flooding recedes within a couple of hours. In the event the road is flooded, DPW and emergency personal need to go out and close the roads and remain there until waters recede. **Solution**: Install 10 gates in the Goffle Road and North 8th Street area and appropriate signage. These will be used to close roads when they become inundated. It will provide safety measures for residents and municipal employees. It will reduce overtime, man hours and vehicle hours. It provides a more visible and sturdier barricade to provide safety measures and prevent cars from entering flooded roadways.	Existing	Coastal Storm, Flood, Severe Weather, Severe Winter Weather	1, 2	Borough DPW, Borough Police	Municipal Budget	Increase safety measures	$20,000	Within 5 years	High	SIP	PP, ES
2020-HAWTHORNE-004	Education and Outreach	**Problem**: While the Borough has hazard-related information on their website, it does not have cover all hazards of concern identified in the HMP.	N/A	All Hazards: Coastal Storm, Dam Failure, Disease Outbreak, Drought,	All	Borough Administration	Borough Budget, FEMA PDM and HMGP	Raise awareness of all hazards, increase education and outreach, community	<$15,000	Within 2 years	Medium	LPR	PR, ES, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: Develop a multi-hazard public education program that will help with informing residents of natural hazards and actions the public can take to be better prepared for the next disaster. This will include providing information on the Borough's website and social media accounts, creating brochures, and displaying information in Borough Hall and the library.		Earthquake, Extreme Temperature, Flood, Geological, Hazardous Substances, Infestation and Invasive Species, Severe Weather, Severe Winter Weather, Wildfire				is better prepared					
2020-HAWTHORNE-005	Update Flood Damage Prevention Ordinance	**Problem**: The current flood damage prevention ordinance (Chapter 247) states that any new development or substantial improvements must be elevated at or above the base flood elevation. This does not meet the minimum requirement set by the State of New Jersey. **Solution**: Update the current flood damage prevention ordinance to require new construction and substantial improvements to be elevated at least one foot above the base flood elevation.	New and Existing	Flood	All	Borough Administration	Borough Budget	Increase protection of development in the floodplain	<$10,000	Within 1 year	High	LPR	PR, PP
		Problem: There are 20 repetitive loss	Existing	Flood	1, 2		Borough Budget	Increases awareness in	<$10,000 for		Medium	LPR	PR, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-HAWTHORNE-006	Repetitive Loss Properties	properties in the Borough. Frequent flooding has resulted in damages to these structures as documented by paid NFIP claims **Solution**: Conduct outreach to the property owners and provide information on mitigation alternatives including elevation, acquisition, and floodproofing the structure. If the homeowners choose elevation or acquisition, the Borough will develop a FEMA grant application to obtain funding to implement the project.				Floodplain Administrator, Homeowner	for outreach, FEMA FMA or HMGP depending on mitigation solution identified	community, reduces flood damage	outreach; $100,000+ for acquisition or elevation	Within 3 years			

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*

- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain Local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.5-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-HAWTHORNE-001	Elevation of Sewer and Pump Stations	1	1	1	1	1	0	0	0	0	1	1	1	1	0	9	High
2020-HAWTHORNE-002	Road Closure Gates on Wagaraw Road	1	1	1	1	1	1	1	0	0	1	1	1	0	0	10	High
2020-HAWTHORNE-003	Road Closure Gates on Goffle Road	1	1	1	1	1	1	1	0	0	1	1	1	0	0	10	High
2020-HAWTHORNE-004	Education and Outreach	1	1	1	1	0	0	0	0	1	1	1	1	0	0	8	Medium
2020-HAWTHORNE-005	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	0	1	1	1	1	0	0	11	High
2020-HAWTHORNE-006	Repetitive Loss Properties	1	1	1	1	1	0	1	0	0	1	0	0	0	0	7	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.5-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storm	-004	-001, -002, -003	-004		-001, -002, -003, -004	-001, -002, -003		
Dam Failure	-004		-004		-004			
Disease Outbreak	-004		-004		-004			
Drought	-004		-004		-004			
Earthquake	-004		-004		-004			
Extreme Temperature	-004		-004		-004			
Flood	-004, -005, -006	-001, -002, -003, -005	-004, -006		-001, -002, -003, -004	-001, -002, -003		
Geological Hazard	-004		-004		-004			
Hazardous Substances	-004		-004		-004			
Infestation and Invasive Species	-004		-004					
Severe Weather	-004	-001, -002, -003	-004		-001, -002, -003, -004	-001, -002, -003		
Severe Winter Weather	-004	-001, -002, -003	-004		-001, -002, -003, -004	-001, -002, -003		
Wildfire	-004		-004		-004			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.5.8 Staff and local Stakeholder Involvement in Annex Development

The Borough of Hawthorne followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.5-18. Contributors to the Annex

Entity	Title	Method of Participation
Richard McAuliffe	OEM	Attended meetings, provided information to complete annex, developed mitigation actions
Brian Vanderhook	Deputy OEM Coordinator	Point of contact; Reviewed the annex
Richard Stewen	Building Official	NFIP Floodplain Administrator; Reviewed the annex
Richard S. Goldberg	Mayor	Reviewed the annex
Eric Maurer	Borough Administrator	Reviewed the annex

Entity	Title	Method of Participation
Laura Foley	CFO	Reviewed the annex
Robert Scully	Public Works Director	Reviewed the annex
Steven Boswell	Engineer	Reviewed the annex
James Knepper	Police Captain	Reviewed the annex
Gene DeAugustine	Fire Official	Reviewed the annex

Figure 9.5-1. Borough of Hawthorne Hazard Area Extent and Location Map 1

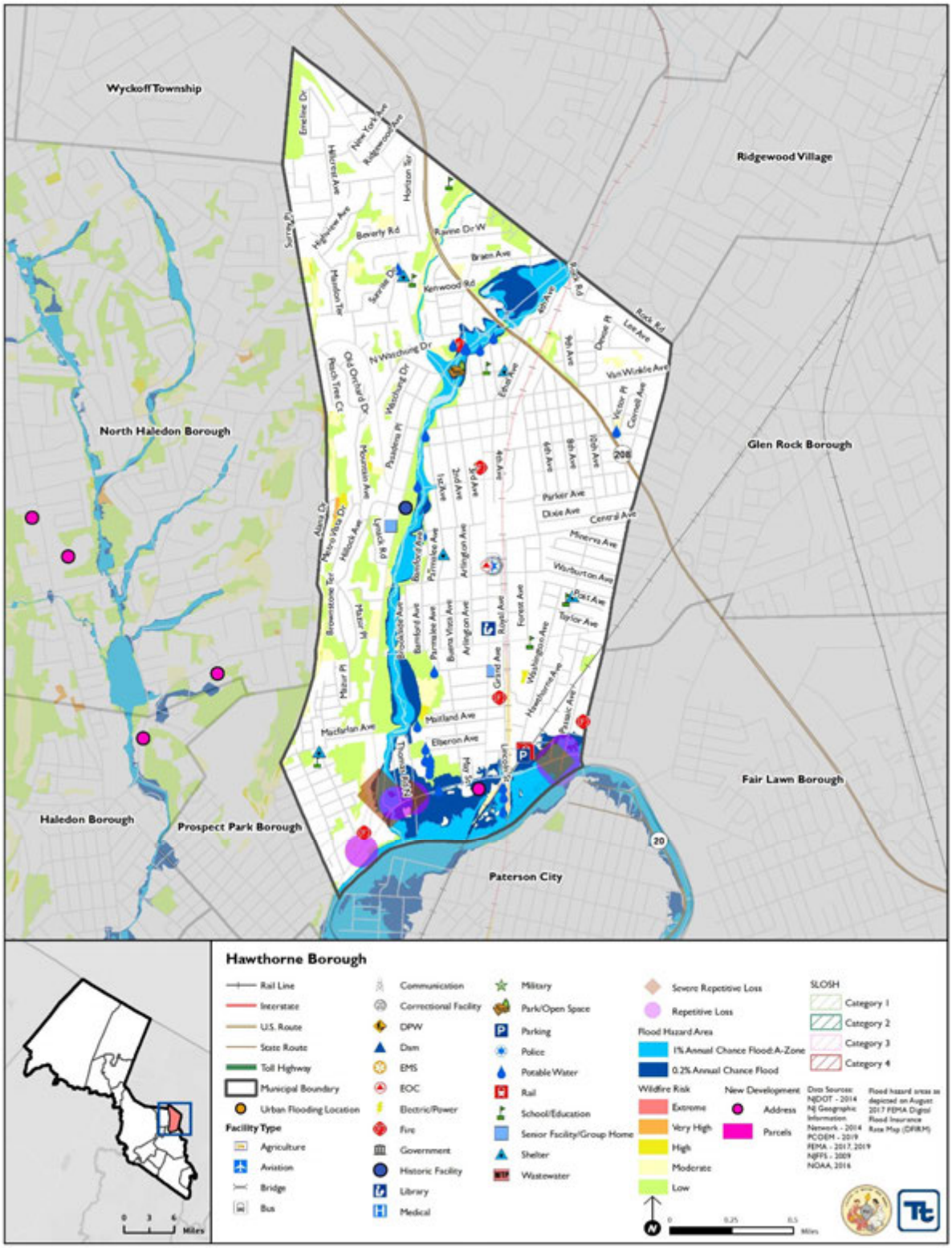
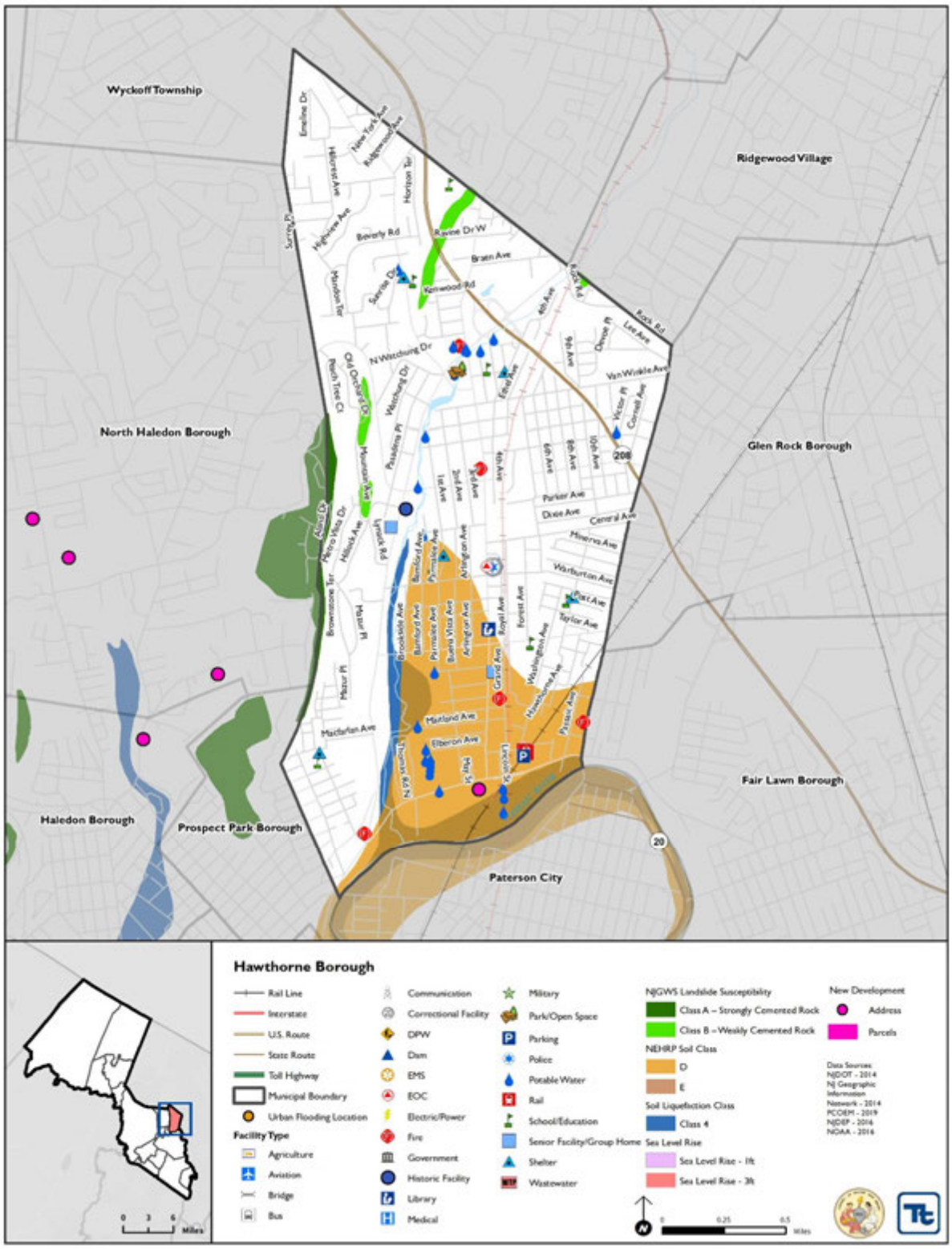


Figure 9.5-2. Borough of Hawthorne Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Elevation of Sewer and Pump Stations		
Project Number:	2020-HAWTHORNE-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Costal Storm, Flood, Severe Weather, Severe Winter Weather		
Description of the Problem:	When the Passaic River floods, severe sewer and pump stations are vulnerable to flood impacts.		
Action or Project Intended for Implementation			
Description of the Solution:	Elevate seven sewer and water pump stations along the Passaic River above the floodplain		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	100-year flood	**Estimated Benefits (losses avoided):**	Continuity of operations, protects infrastructure
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	>$50,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	FEMA HMGP and FMA
Responsible Organization:	Borough DPW and Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Construct flood walls around stations	$20,000+	Not feasible as it could impact natural drainage; costly; might restrict access to facilities
	Install floodproof doors	~$10,000	Provides protection to the inside of the station but not any infrastructure outside the building

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Elevation of Sewer and Pump Stations	
Project Number:	2020-HAWTHORNE-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides continuity of operations of equipment to help residents
Property Protection	1	Protects equipment from flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	There is political support for this project
Legal	0	
Fiscal	0	Borough would need grant funding to complete
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Costal Storm, Flood, Severe Weather, Severe Winter Weather
Timeline	1	To be completed within 5 years
Agency Champion	1	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Education and Outreach		
Project Number:	2020-HAWTHORNE-004		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	While the Borough has hazard-related information on their website, it does not have cover all hazards of concern identified in the HMP.		
Action or Project Intended for Implementation			
Description of the Solution:	Develop a multi-hazard public education program that will help with informing residents of natural hazards and actions the public can take to be better prepared for the next disaster. This will include providing information on the Borough's website and social media accounts, creating brochures, and displaying information in Borough Hall and the library.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Raise awareness of all hazards, increase education and outreach, community is better prepared
Useful Life:	N/A	**Goals Met:**	All
Estimated Cost:	<$15,000	**Mitigation Action Type:**	LPR
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	Borough Budget, FEMA PDM and HMGP
Responsible Organization:	Borough Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Develop informational flyers for residents	<$10,000	Does not get to all people, limited space for all information
	Maintain current outreach on the website	<$10,000	Does not include information on all hazards of concern

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Education and Outreach	
Project Number:	2020-HAWTHORNE-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Increases awareness and education of residents
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	Borough would need grant funding to complete
Environmental	0	
Social	1	
Administrative	1	Administrative support and capabilities to complete project
Multi-Hazard	1	All hazards
Timeline	1	To be completed within 5 years
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

9.6 TOWNSHIP OF LITTLE FALLS

This section presents the jurisdictional annex for the Township of Little Falls. The annex includes a general overview of the Township of Little Falls; an assessment of the Township of Little Falls' risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.6.1 Hazard Mitigation Planning Team

The following individuals are the Township of Little Falls' identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.6-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: James DiMaria, Construction Official Address: 225 Main Street Little Falls, NJ 07424 Phone Number: 973-256-6182 Email: jdimaria@lfnj.com	Name / Title: Daniel D. Gianduso, OEM Address: 225 Main Street Little Falls, NJ 07424 Phone Number: 973-960-9268 Email: dgianduso@lfnj.com
NFIP Floodplain Administrator	
Name / Title: James DiMaria, Construction Official Address: 225 Main Street Little Falls, NJ 07424 Phone Number: 973-766-2478 Email: jdimaria@lfnj.com	

9.6.2 Jurisdiction Profile

The Township of Little Falls is named for the Passaic River waterfall that formerly spilled downstream from the dam in front of the Beattie Mill. The photo at right shows what the falls looked like back in 1890, when Union Ave. crossed the Passaic River via a covered bridge.

Little Falls can trace its heritage back to 1711. Its 2.8 square miles, now home to a population of about 11,000, are bounded by the communities of Montclair, Wayne, Cedar Grove, Woodland Park, Totowa, North Caldwell, Fairfield and Clifton.

Starting January 1, 2005, the form of government was changed as the result of a public referendum. The current government is a Mayor/Council form authorized by the New Jersey Faulkner Act. Under the new government, the voters directly elect a Mayor to a four-year term. The Mayor is responsible for the administration of the Township. The Township Council members, who are elected to four-year staggered terms, perform the legislative duties of the Township.

According to the U.S. Census Bureau, the Township has a total land area of 2.81 square miles, of which 2.735 square miles is land and 0.075 square miles is water.

According to the U.S. Census, the 2010 population for the Township of Little Falls was 14,432. The estimated 2017 population was 14,524, a 0.6 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.2 percent of the population is 5 years of age or younger and 18 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.6.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.6-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.6-1 and 9.6-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.6-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	4	4	7	18	37
Multi-Family	0	0	0	24	0
Other (commercial, mixed-use, etc.)	4	5	1	8	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
44 Main Street	Mixed Use	4/42	44 Main Street	N/A	Complete
Autumn Point	Mixed Use	24	Autumn Court	N/A	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
383 Main	Multi-Family	185	77/3	0.2 % Flood Zone	Proposed
383 Main	Town House	102	77/4	0.2 % Flood Zone	Proposed

** Only location-specific hazard zones or vulnerabilities identified.*

9.6.4 Capability Assessment

The Township of Little Falls performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in the Capability Assessment below. The Township of Little Falls identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Township of Little Falls and where hazard mitigation has been integrated.

Table 9.6-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State, Local	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Administered by Construction Code Official.*					
Zoning Code	Yes	Local	Yes	No	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Chapter 280 of the municipal code. Administered by the Zoning Officer.*					
Subdivisions	Yes	Local	Yes	No	-
Comment: *Subdivision Ordinance. Chapter 277 of the municipal code. Administered by the Zoning Officer.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Administered by the Construction Code Official. The Stormwater Management Ordinance (Chapter 218 of the municipal code) establishes minimum stormwater management requirements and controls for "major development. The Storm Sewer System (Separate) Ordinance (Chapter 216 of the municipal code) prohibits the spilling, dumping or disposal of materials other than stormwater to the municipal separate storm sewer system (MS4) operated by the Township of Little Falls, so as to protect public health, safety and welfare, and prescribes penalties for the failure to comply.*					
Post-Disaster Recovery	No	Local	-	No	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	Local	Yes	No	-
Comment: *State mandated at local level.*					
Site Plan Review	Yes	State	Yes	No	-
Comment: *Chapter 280 of the municipal code. Administered by the Planning Board.*					
Environmental Protection	Yes	Local	Yes	No	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Chapter 30 Stormwater Control. Chapter 1276.8 Litter and Stream Ordinance and Chapter 72 Fertilizer of the municipal code.*					
Flood Damage Prevention	Yes	Local	Yes	No	-
Comment*: Administered by the Construction Code Official. The Flood Damage Prevention Ordinance (Chapter 86 of the municipal code) was adopted to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:* *•To protect human life and health;* *•To minimize expenditure of public money for costly flood control projects;* *•To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* *•To minimize prolonged business interruptions;* *•To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
•To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas; *•To ensure that potential buyers are notified that property is in an area of special flood hazard; and* *•To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* *The Township plans to update the Flood Damage Prevention Ordinance to include 2 feet of freeboard and cumulative damages.*					
Wellhead Protection	No	-	Yes	No	-
Comment:					
Emergency Management	Yes	Local	-	No	-
Comment: *Chapter 65 of the municipal code. Establishes the Emergency Management Coordinator, Deputy Coordinator, Emergency Management Council, and their duties. Administered by Emergency Management.*					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	Yes	Local	-	-	-
Comment: *In flood hazard prevention, substantial improvements post flood.*					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: *12-5-13 (reexamination). Administered by the Planner. "The 2013 Reexamination included updated comprehensive goals. The goals tied to hazard mitigation included:* *•Encourage the promotion of practical and appropriate development controls in order to promote and be consistent with the goals of the MLUL (N.J.A.C. 40:55D-2), which advocates the protection of the general health, safety and general welfare of the residents;* *•Protect the quality of surface and ground water;* *•To provide a coordinated transportation system for the movement of people and goods that is safe, efficient and accessible to all;* *•Balance redevelopment initiatives in a manner that considers the fiscal impacts to the Township while not adversely impacting traffic, population, safety and environment, character and privacy of existing residential area or placing increased demands on municipal services;* *•Improve capabilities, coordination and opportunities at the municipal level and county levels to plan and implement hazard mitigation projects, programs and activities to protect the residents of the Township of Little Falls."*					
Capital Improvement Plan	Yes	Local	Yes	Yes	-
Comment: *Per NJSA 40:55D-29 the governing body is authorized to direct the planning board to prepare a CIP with at least a six year planning horizon. Capital Improvements are identified annually and administered by Administration.*					
Disaster Debris Management Plan	Yes	Local	Allowed	No	-
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	-	-
Comment: *Township Code Chapter: 86.7. Administered by the Floodplain Manager.*					
Stormwater Management Plan	Yes	Local	No	No	-
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). Township Code Chapter: 218.1. Administered by the Engineering Department.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	No	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Within litter ordinance.*					
Urban Water Management Plan	No	-	Yes	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	No	-
Comment: *October 28, 2013 Little Falls NJ Master Plan. Administered by the Administrator.*					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	No	-
Comment: *October 28, 2013 Little Falls NJ Master Plan. Administered by the Administrator.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	Local	No	No	-
Comment: *Transit Village Plan: Brings in business, promotes walkable routes.*					
Other	No	-	No	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	*Yes*	*Yes*	No
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. February 2019. The Emergency Management Plan is administered by OEM.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	Yes	Yes	-
Comment: *Included as annex in CEMP.*					
Post-Disaster Recovery Plan	Yes	Local	No	Yes	-
Comment: *Included as annex in CEMP.*					
Continuity of Operations Plan	Yes	Local	No	Yes	-
Comment: *Included as annex in CEMP.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Public Health Plan	Yes	Local	No	Yes	-
Comment: *Included as annex in CEMP.*					
Other	No	-	No	-	-
Comment:					

Table 9.6-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes; Planning and Engineering Departments
Does your jurisdiction have the ability to track permits by hazard area?	Yes. The Township has GIS based software and the tax assessor's records have SFHA information.
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, redevelopment areas have been identified. The Township has an approved Housing Element and Fair Share Plan that prepared a vacant land analysis identifying all areas that could support AH, both 100% and inclusionary, residential development.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Little Falls.

Table 9.6-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	Yes	OEM
Environmental Board / Commission	Yes	Planning Board
Open Space Board / Committee	Yes	Administrator
Economic Development Commission / Committee	No	-
Warning Systems / Services (, outdoor warning signals)	Yes	CodeRED, Nixle, Social Media, Email blast, mobile electronic signs, website
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Fire/ Police/ Office of Emergency Management
Technical/Staffing Capability		

Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Contract with Riddick Associates
Engineers or professionals trained in building or infrastructure construction practices	Yes	Contract with Riddick Associates
Planners or engineers with an understanding of natural hazards	Yes	Contract with Aliamo Engineering
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Green building strategies in place
Staff with education/knowledge/training in low impact development	Yes	Township Planner
Surveyor	No	-
Stormwater engineer	Yes	Dennis Lindsay, H2M Architects & Engineers
Personnel skilled or trained in GIS applications	Yes	3rd Party
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management
Grant writers	Yes	Outside contractor
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Township of Little Falls.

Table 9.6-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	When Available
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Little Falls.

Table 9.6-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, numerous public information officers per department
Do you have personnel skilled or trained in website development?	Sub-contract
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes; Flood Information page
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Facebook, Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes; Flood Board, Open Space Committee
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	No
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; CodeRED, Nixle, Social Media, Email blast, mobile electronic signs, website

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Little Falls.

Table 9.6-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	5	2020
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	3	2014
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

ADAPTIVE CAPACITY

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

The Township of Little Falls complies with energy code (IBC) and is looking into LED outfitting. The township noted that flooding is likely to increase due to climate change but that steps have been taken to reduce future flooding impacts through the limiting of impermeable surfaces (covered in the township's stormwater management requirements). The administration would be supportive of climate change/green initiatives.

Table 9.6-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	High
Dam Failure	Low
Disease Outbreak	Low
Drought	Low
Earthquake	High
Extreme Temperature	Low
Flood	High
Geological Hazards	Medium
Hazardous Substances	Low
Severe Weather	Low
Severe Winter Weather	Low
Wildfire	High

Notes:
High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;
Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.6-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	James DiMaria/Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	February 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Yes/Freeboard Requirement
When was the most recent Community Assistance Visit or Community Assistance Contact?	November 2019
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
□ If so, what type of assistance/training is needed?	Continuing education
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	Yes, Class 6. The township is invested in maintaining the current class ranking.
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Flood insurance policies: 484 Insurance in force" $108,657,200 Premium in force: $680,736

Criterion	Response
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 1,723 Claims open or closed without payment: 216 Total payments for losses: $32,393,166
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	Yes

** Policies and Claims from https://bsa.nfipstat.fema.gov/reports/1011.htm and https://bsa.nfipstat.fema.gov/reports/1040.htm as of 09/30/2018*

RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).

9.6.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of Little Falls made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Public Works:** The Department of Public Works (DPW) is responsible for constructing and maintaining much of the Township's vital systems of roads, streets, bridges, storm sewers, sanitary sewers and the many related components.
- **Planning Board:** The Township of Little Falls Planning Board (established through Chapter 3 of the municipal code) is comprised of nine members is responsible for making updates to the Master Plan, approve uses as per the Land Use procedures (Chapter 109 of the municipal code), and undertake site plan reviews.
- **Shade Tree Commission:** The Little Falls Shade Tree Commission has the responsibility for the regulation, planting and care of shade and ornamental trees and shrubbery located on public property in the Town of Little Falls. This commission helps sustain healthy populations of trees by planting new trees as well as pursuing the removal and replacement of all damaged, dead, hazardous or diseased trees, and the pruning of existing trees to foster their health and longevity in an effort to improve and beautify the town. The Commission works with the Department of Public Works as well as assisting the Planning Board and/or Building Department in an advisory capacity when applications involve the preservation and inventory of trees within the town. In addition, the Commission communicates to residents and businesses the need to protect and maintain each and every tree as healthy trees represents a long-term investment in the beauty, biodiversity and historic character of Little Falls.
- **Flood Control Board:** The Flood Control Board was established (via Chapter 85 of the municipal code) to contribute to the overall management of the surface water of the Passaic River and the Peckman River basins, insofar as those basins impact upon the properties located within the Township of Little Falls. The Board may make, or cause to be made, any necessary surveys, investigations, studies, borings, maps, plans, drawings and estimates of costs and of revenues relating to the provision of flood control facilities on the Passaic River and the Peckman River; provided, however, that the Board's

recommendations are approved by the member municipalities and the lead agency first secures or approves the funding by way of grants for such surveys, investigations and the like.

- **Emergency Management:** Chapter 65 of the municipal code establishes the positions of Emergency Management Coordinator and Deputy Coordinator, Emergency Management Council, and outlines the duties of each position and the board in regards to emergency management.
- **Emergency Communication**: The Township utilizes CodeRED and Nixle to complete outreach and emergency warnings to residents regarding hazardous events.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the Township will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report.

9.6.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Township of Little Falls history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.6-11 provides details regarding municipal-specific loss and damages the township experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.6-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6-7, 2018	Severe Winter Storm and Snowstorm (DR-4368)	Yes	Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. CoCoRaHS observers and trained spotters reported 11 to 22 inches of snowfall. Significant tree damage was reported across Passaic county due to heavy wet snow and strong winds.	The township incurred overtime costs for debris removal.
August 11, 2018	Flash Flood	N/A	A stalled stationary boundary within a very moist airmass provided a focusing mechanism for several rounds of heavy rain that resulted in widespread flash flooding across northeast New Jersey. The Caldwell, NJ ASOS recorded 4.92 inches of rain, and multiple other stations across northeast New Jersey received	The Little Falls area of Passaic County was particularly hard hit when rising water from the Peckman River swept away numerous cars from the Route 46 Chrysler, Jeep, Dodge dealership.

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
			between 2.5 inches and 4 inches of precipitation.	

9.6.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.6-12 summarizes the Township of Little Falls risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.6-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	14,524	100-year MRP Hurricane:	3,412	100-year MRP Hurricane:	$6,006,281	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	1,502	NEHRP D&E:	313	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	1,222	Liquefaction Class 4:	324	500-year MRP building damages/loss:	$3,182,831	
						2,500-year MRP building damages/loss:	$46,109,277	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,554	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators and HVAC; thermal expansion and other impacts to infrastructure.		Low
		Population Below Poverty Level:	944					

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	2,538	1% annual chance	674	1% annual chance	$31,008,960	High
		0.2% annual chance	3,340	0.2% annual chance	1,594			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	0	Class A:	0	Class A:	$0	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	1	Replacement cost value of buildings located in the hazard area:	$599,082	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Little Falls.

- Number of repetitive loss (RL) properties: 135
- Number of severe repetitive loss (SRL) properties: 133
- Number of RL/SRL properties that have been mitigated: 57 properties in total (according to State NFIP records). Recently 35 properties have been demolished with 1 elevated. A total of 16 properties were recently completed with the CDBG-DR funds.

Note: The number of SRL properties excludes RL properties.
RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.6-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Little Falls Division of Fire Company 3*	Fire		X	
Little Falls DPW*	DPW		X	
Little Falls Signac Pump Station* (Fairfield Pumping Station)	Stormwater Pump	X	X	2020-Little Falls-011
Little Falls Sindle Ave. Pump Station*	Wastewater Pump		X	
NJ State Police Laboratory*	Police	X	X	2020-Little Falls-012

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- The Township has identified the following flash flood prone areas: Francisco Ave, Montclair Ave, Willmore Road
- Erosion status of rivers is unknown in some locations.
- Obstructions exist along rivers.
- Illicit sump pump connections may be overloading the system.
- Flooding occurs in the Jackson Park area from Peckman to Passaic River
- The Township is not a part of the NWS Storm Ready Program.
- The State Police North Regional Laboratory floods.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Little Falls that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Little Falls has significant exposure. Refer to Figures 9.6-1 and 9.6-2 at the end of this section.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Township of Little Falls. The Township of Little Falls has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Township indicated the following:

- The Township changed the hazard ranking of Coastal Storm from high to low due to generators and stream cleaning resulting in reductions in risk.
- The Township changed the hazard ranking of flood from high to medium due to mitigation actions such as house raising, demolitions, and emergency notifications reducing risk.
- The Township changed the hazard ranking of severe weather from medium to low due to maintenance efforts by the DPW to reduce risk.
- The Township changed the hazard ranking of severe winter weather from medium to low due to DPW operations such as brining and street clearing which reduce risk.

Table 9.6-13. Township of Little Falls Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Low	Medium	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Low	Medium	Medium	Low	Low	Low

9.6.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as

such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.6-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Little Falls-1: HMGP 19 Property Acquisitions	Town Administrator	Complete for elevation	X	2020-Little Falls-001
Little Falls-2: Install an early warning system to alert regarding flood water levels on the Peckman and Passaic Rivers	OEM	Complete at Peckman River		
Little Falls-3: Install new river gauges on Peckman and Passaic rivers to be useful for Little Falls Emergency Management	OEM	Complete at Peckman River		
Little Falls-4: Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what citizens can do in the way of mitigation and preparedness, including flood insurance.	Construction Office	Complete, Mailings, brochures at town hall, construction office, information at various departments, door to door information after floods. Social media have been added. Push to talk on Township Iphones for emergency communications. Established a flow chart for emergency outreach actions.		
Little Falls-5: Stream bank stabilization in the Township at the following locations: - Along the Peckman River on Sindle Avenue to protect the DPW building - Along the Peckman River from Tulip Gardens and Passaic Valley High School to Route 46	Engineering	In Progress; Emergency streambank stabilization using boulders and rock. County has put scour resistant rock East Main Street.	X	2020-Little Falls-002
Little Falls-6: Upgrade and improvement of embankment wall located along Cedar Grove Road	Engineering	No Progress	X	2020-Little Falls-003
Little Falls-7: Backup power for the Municipal Building/ Town Clerk/ Data Storage Facility on 225 Main Street	Town Administrator	In progress, Data storage complete but no backup power	X	2020-Little Falls-004
Little Falls-8: Upgrade of storm-water pumping station (Williams Street) facilitating water removal from the following locations: Garden Street, Roselle Street, Dairy Street, Lyttel Street, Barber Street, River View Circle, William Street, Louis Street, Bogart Place, Fairfield Avenue, Island Avenue, West End Avenue, Orchard Avenue, Grey Rock	Engineering	In progress	X	UPGRADE Fairfield Pump Station
Little Falls-9: Elevation of properties on William Street, Louis Street, Garden Street, Roselle Street, Dairy Street, Lyttel Street, and Barber Street	Town Administrator	Complete		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Little Falls-10: Obtain needed equipment for CERT. Specifically identified a trailer containing detour signs and other traffic diversion equipment.	OEM	No Progress	X	2020-Little Falls-005
Little Falls-11: Improve understanding of natural hazards and hazard areas (compiling and archiving flood loss information, record high-water marks after major events, install high-water mark monuments to promote flood awareness, improve hazard mapping, etc.)	Public Works	In Progress, Outreach and education complete, inundation mapping	X	2020-Little Falls-006
Little Falls-12: Develop a Debris Management Plan	Public Works	In progress, have an SOP for post event stormwater	X	2020-Little Falls-007
Little Falls-13: Implement activities targeted to reduce the impacts of household hazardous waste resulting from flood events. These could include public education and holding some of the regular County Hazardous-Waste days in the Township.	Public Works	Complete		
Little Falls-14: Start a mitigation fund in the town to support mitigation initiatives (including the 25% local share of federal grants).	Town Administrator	No Progress	X	
Little Falls-15: Where appropriate, support retrofitting, purchase, or relocation of structures and infrastructure located in hazard-prone areas to protect structures from future damage	Town Administrator	Complete		

In addition to the above progress, the Township of Little Falls identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Stormwater Management Plan has been revamped
- The township completed an initiative to go after illicit sump pump connections.
- I&I program has been developed for sanitary sewers.
- The township has sealed manholes in order to make them watertight.
- The township received a track-hoe for debris removal and shoal removal to be shared with Woodland Park and Little Falls.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Little Falls participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Little Falls participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and

mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.6 16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Little Falls would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.6-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Little Falls-001	Support the mitigation of vulnerable structures via retrofit	Flood prone properties are at risk for future damages	Acquire and demolish flood prone properties	Existing	Flood, Severe Weather, Severe Winter Weather	1, 2	FPA, Town Administrator, supported by homeowners	HMGP, CDBG-DR	Properties removed from floodplain	$3 Million	Within 5 years	High	SIP	PP
2020-Little Falls-002	Remove shoals within river	Shoals create erosional points on adjacent banks	Remove shoals within river to prevent erosion	N/A	Flood, Severe Weather, Severe Winter Weather	1, 2	Engineering	USACE	Erosion reduced	$15,00	Within 5 years	High	SIP, NSP, NRP	PP, NR
2020-Little Falls-003	Cedar Grove Road embankment wall	Embankment in need of replacement and upgrade	Upgrade and improvement of embankment wall located along Cedar Grove Road	Existing	Flood, Severe Weather, Severe Winter Weather	1, 2	Engineering	USACE	Embankment strengthened	$30,000	Within 5 years	High	SIP, NSP, NRP	PP
2020-Little Falls-004	Backup power for the Town Hall	Municipal Building/Town Clerk lacks backup power.	Purchase and install backup generator for the Municipal Building/ Town Clerk	Existing	All Hazards: Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological, Hazardous	1, 2, 6	Town Administrator	HMGP, State Empg Fund	Critical facility protected from power loss	$30,000	1 year	Medium	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
					Substances, Infestation, Severe Weather, Severe Winter Weather, Wildfire									
2020-Little Falls-005	Police Department equipment	Police Department is in need of additional equipment to respond to hazard events.	Obtain needed equipment for Police Department. Specifically identified a trailer containing detour signs and other traffic diversion equipment.	N/A	Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological, Hazardous Substances, Infestation, Severe Weather, Severe Winter Weather, Wildfire	5	OEM	Homeland Security Grants	Police Department properly equipped	$100,000	1 year	Medium	LPR	PR, ES
2020-Little Falls-006	Inundation mapping and highwater mark signs.	Residents need additional understanding of natural hazard areas	Improve understanding of natural hazards and hazard areas (compiling and archiving flood	N/A	Flood	3, 4	Public Works	Township budget	Increased understanding of	$10,000	Within 3 years	Medium	LPR, EAP	PR, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			loss information, record high-water marks after major events, install high-water mark monuments to promote flood awareness)						hazard zones					
2020-Little Falls-007	Debris Management Plan	A debris management plan is needed	Develop a Debris Management Plan	N/A	Coastal Storm, Flood, Severe Weather, Severe Winter Weather	5	Public Works	NJDCA Grants, Township Budget	Plan established	$1,000	1 year	Medium	LPR	PR, ES
2020-Little Falls-008	Update Flood Damage Prevention Ordinance	The Flood Damage Prevention Ordinance could be stronger.	The Township will update the ordinance to include cumulative substantial damages and 2 feet of freeboard.	New	Flood	2	FPA, Administration	Township budget	Stronger requirements in flood zone	Staff time	6 months	High	LPR	PR
2020-Little Falls-009	Flood Cameras	Stream gauges in the Township lag in reporting of current conditions. This prevents proper response to events.	The Township will provide cameras on the Franciso Bridge, E. Man Street, and Route 46 East and West Bridge and connect the live footage to the Police headquarters and the Township website.	Existing	Flood	1, 2, 3	Police Department, DPW, OEM	Township budget, private grant opportunities, PDM, FMA	Reduction in flood response requirements, Public information, quicker respon	$10,000	Short	High	LPR, EAP	ES, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
									se to floodi ng					
2020-Little Falls-010	Peckman River Flood Tunnel	Heavy rainfall results in the Peckman River overflowing its banks.	The USACE will construct a double box diversion culvert, or tunnel structure to be built under roadways to divert floodwater from the Peckman River into the Passaic River.	New and Existing	Flood	1, 2	USACE	USACE, HMGP	Reduction in flooding of neighborhood and businesses	$172 million	Within 3 years	High	SIP	SP
2020-Little Falls-011	Upgrade Fairfield Pump Station	The Fairfield Pump Station is located in the 100-year floodplain and needs to be upgraded.	The Township will upgrade the Fairfield Pump Station from a 10,000 GPM to a 25,000 GPM and elevate the facility.	Existing	Flood	1, 2	Engineering	Township budget, HMGP, FMA, PDM	Increased capacity and reduction in flood risk.	$50,000	Short	High	SIP	SP
2020-Little Falls-012	Conduct outreach to NJ State Police Laboratory	The NJ State Police Laboratory is located in the 100-year floodplain.	The FPA will contact the facility manager and discuss options for mitigating the facility.	Existing	Flood	1, 2, 3, 4	FPA	Township budget	Reduction in flood risk	$200	Within 6 months	High	EAP	PI
2020-Little Falls-013	Mitigation fund	The Township needs a fund to provide match for federal mitigation grants.	Start a mitigation fund in the town to support mitigation initiatives (including the 25% local share	New and Existing	Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthqua	5	Town Administrator	Town budget	Provide financial capability to apply	TBD by size of fund	Within 3 years	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			of federal grants).		ke, Extreme Temperature, Flood, Geological, Hazardous Substances, Infestation, Severe Weather, Severe Winter Weather, Wildfire				for grants					

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*

- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.6-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Little Falls-001	Support the mitigation of vulnerable structures via retrofit	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Little Falls-002	Remove shoals within river	1	1	0	1	1	1	0	1	1	1	0	1	1	1	11	High
2020-Little Falls-003	Cedar Grove Road embankment wall	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Little Falls-004	Backup power for the Town Hall	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Little Falls-005	Police Department equipment	1	1	0	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-Little Falls-006	Inundation mapping and highwater mark signs.	1	0	0	0	1	1	0	1	1	1	0	0	1	1	8	Medium
2020-Little Falls-007	Debris Management Plan	0	1	1	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-Little Falls-008	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Little Falls-009	Flood Cameras	1	1	1	1	1	1	0	0	1	1	0	1	1	1	11	High
2020-Little Falls-010	Peckman River Flood Tunnel	1	1	1	1	1	1	1	1	1	1	0	0	1	1	12	High
2020-Little Falls-011	Upgrade Fairfield Pump Station	0	1	1	1	1	1	0	1	1	1	0	1	1	1	11	High
2020-Little Falls-012	Conduct outreach to NJ State Police Laboratory	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High
2020-Little Falls-013	Mitigation fund	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.6-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	2020-Little Falls-005, 2020-Little Falls-007, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005, 2020-Little Falls-007			
Dam Failure	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Disease Outbreak	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Drought	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Earthquake	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Extreme Temperature	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Flood	2020-Little Falls-005, 2020-Little Falls-006, 2020-Little Falls-007, 2020-Little Falls-008, 2020-Little Falls-013	2020-Little Falls-001, 2020-Little Falls-002, 2020-Little Falls-003, 2020-Little Falls-004	2020-Little Falls-006, 2020-Little Falls-009, 2020-Little Falls-012	2020-Little Falls-002	2020-Little Falls-005, 2020-Little Falls-007, 2020-Little Falls-009	2020-Little Falls-010, 2020-Little Falls-011		
Geological Hazards	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Hazardous Substances	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			
Infestation and Invasive Species	2020-Little Falls-013							
Severe Weather	2020-Little Falls-005, 2020-Little Falls-007, 2020-Little Falls-013	2020-Little Falls-001, 2020-Little Falls-002, 2020-Little Falls-003, 2020-Little Falls-004		2020-Little Falls-002	2020-Little Falls-005, 2020-Little Falls-007			

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Severe Winter Weather	2020-Little Falls-005, 2020-Little Falls-007, 2020-Little Falls-013	2020-Little Falls-001, 2020-Little Falls-002, 2020-Little Falls-003, 2020-Little Falls-004		2020-Little Falls-002	2020-Little Falls-005, 2020-Little Falls-007			
Wildfire	2020-Little Falls-005, 2020-Little Falls-013	2020-Little Falls-004			2020-Little Falls-005			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.6.9 Staff and Local Stakeholder Involvement in Annex Development

The Township of Little Falls followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.6-18. Contributors to the Annex

Entity	Title	Method of Participation
Daniel D. Gianduso	Office of Emergency Management	Secondary POC, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
James DiMaria	Construction/Zoning Official; NFIP Floodplain Administrator (FPA)	Primary POC, NFIP FPA, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
Thomas Lemanowicz	Engineer	Reviewed the annex
James Damiano	Mayor	Reviewed the annex
Jeff Janota	Land Use Planner	Reviewed the annex
Charles Cuccia	Fiscal/CFO	Reviewed the annex
Phil Simone	Public Works Director	Reviewed the annex
Steve Post	Chief of Police	Reviewed the annex
Thomas Lemanowicz	Engineer	Reviewed the annex
James Damiano	Mayor	Reviewed the annex

Figure 9.6-1. Township of Little Falls Hazard Area Extent and Location Map 1

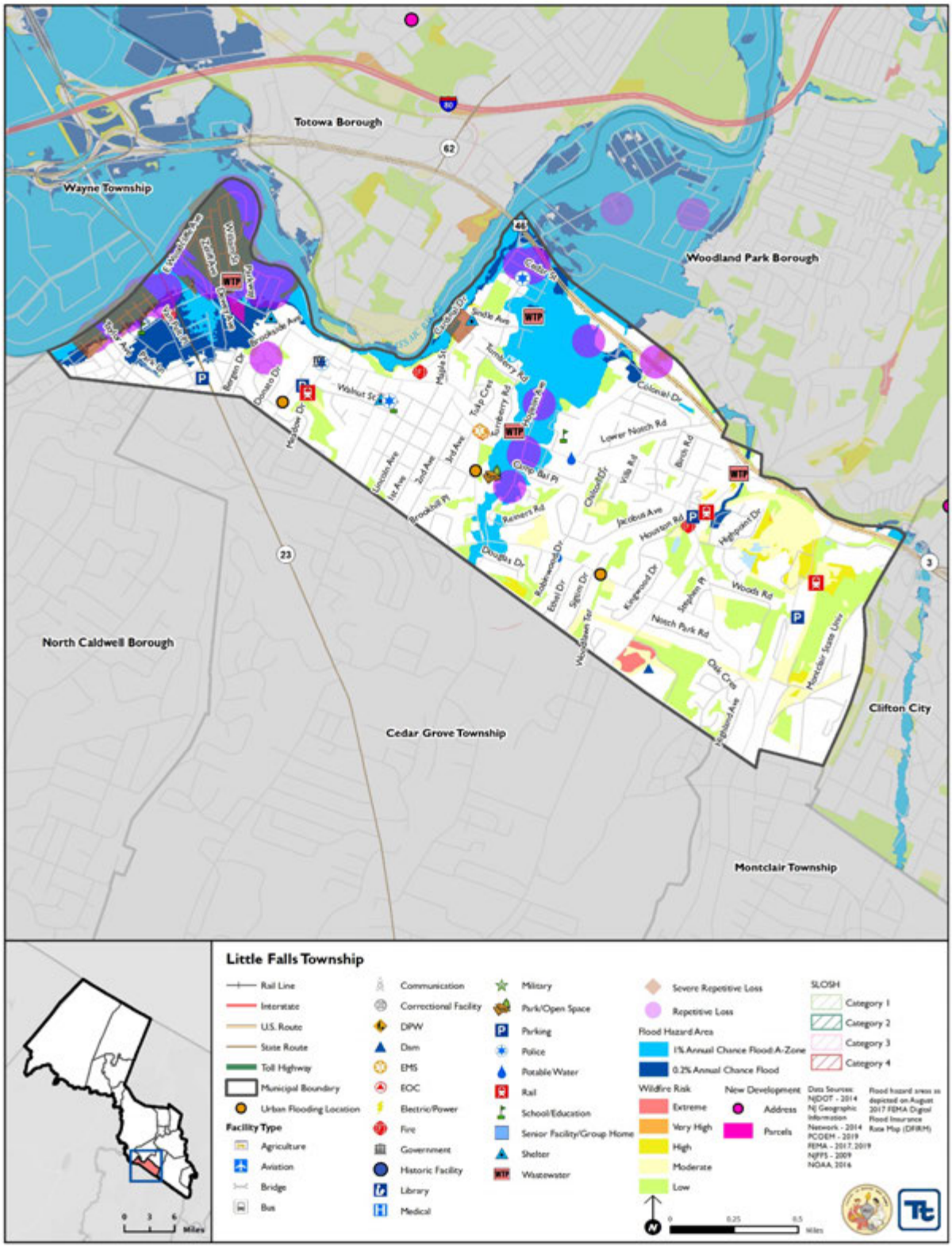
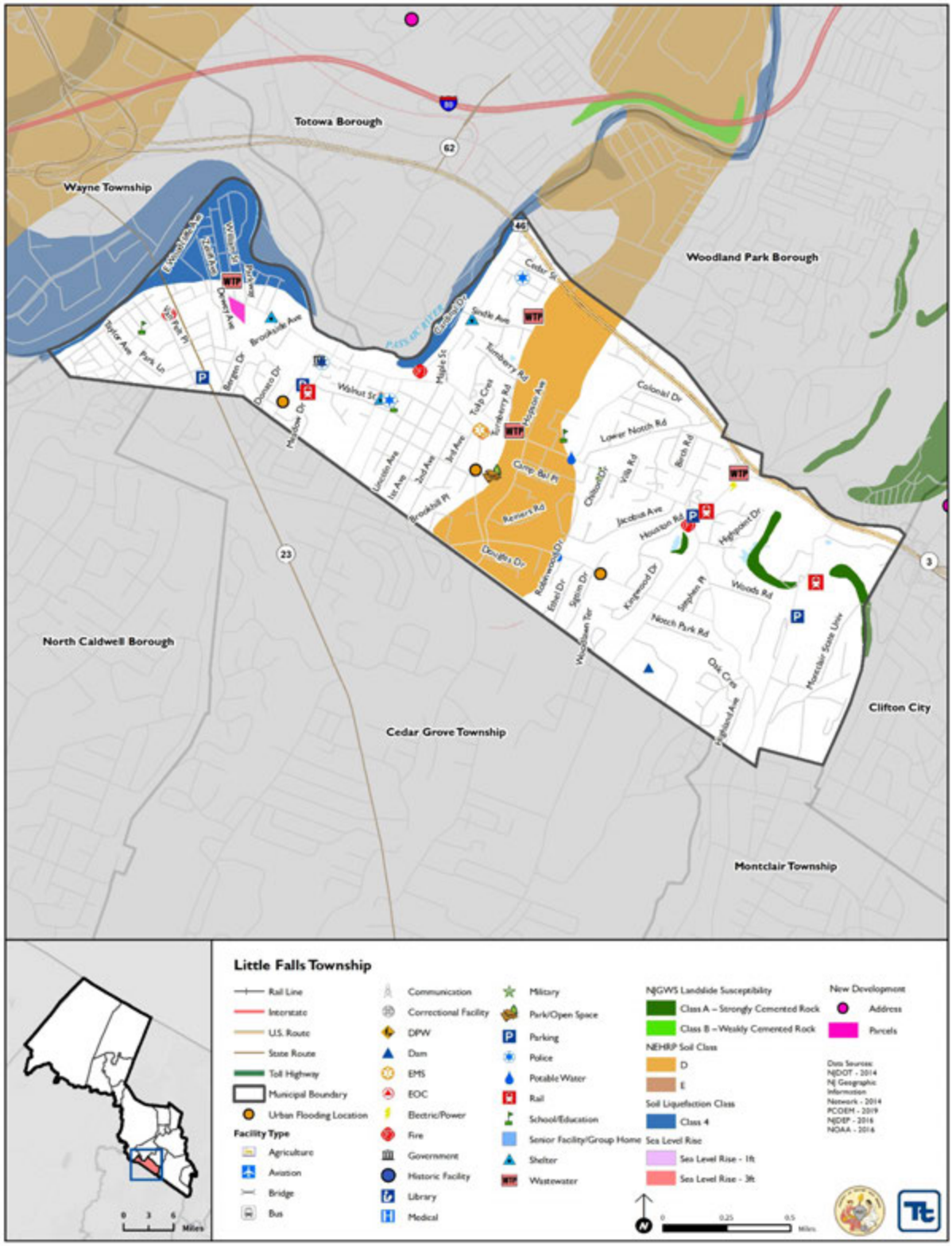


Figure 9.6-2. Township of Little Falls Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Support the mitigation of vulnerable structures via retrofit		
Project Number:	2020-Little Falls-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in 205 repetitive loss properties and 46 severe repetitive loss properties.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$3Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Five years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, Engineering, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Little Falls-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from areas of Township where acquisitions are used.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Cedar Grove Road embankment wall		
Project Number:	2020-Little Falls-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Severe Winter Weather		
Description of the Problem:	The embankment on Cedar Grove Road is in need of replacement and upgrade to prevent slumping and collapse.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will upgrade and strengthen the embankment wall located along Cedar Grove Road, following a feasibility assessment of the best design for the site.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by feasibility assessment	**Estimated Benefits (losses avoided):**	Embankment strengthened, roadway kept open
Useful Life:	30 years	**Goals Met:**	1, 2
Estimated Cost:	TBD by feasibility assessment	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	USACE
Responsible Organization:	Engineering	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Close roadway permanently	$200	Roadway needs to remain open
	Relocate roadway	N/A	Roadway can't be relocated

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Cedar Grove Road embankment wall	
Project Number:	2020-Little Falls-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect lives of those who use the roadway
Property Protection	1	Project protects roadway
Cost-Effectiveness	1	
Technical	1	
Political	1	There is support for the project
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	Project will protect roadway use
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Severe Winter Weather
Timeline	0	Within 5 years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Backup power for the Town Hall		
Project Number:	2020-Little Falls-004		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	Currently, the Town Hall does not have a generator to supply power to the community during a power outage		
Action or Project Intended for Implementation			
Description of the Solution:	The Town Engineer will research what size generator is necessary to supply backup power the Town Hall. The Town will then purchase and install a generator and necessary electrical components at the Town Hall.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations; provides a potential shelter for residents
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$25,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Immediately after funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Town Board, Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup power for the Town Hall	
Project Number:	2020-Little Falls-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Town Hall.
Property Protection	1	Project will protect Town Hall from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The town has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	1 year
Agency Champion	1	Town Board, Engineer
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Flood Cameras		
Project Number:	2020-Little Falls-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Stream gauges in the Township lag in reporting of current conditions. This prevents proper response to events. Some events also result in gauge failure.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will provide cameras on the Franciso Bridge, E. Man Street, and Route 46 East and West Bridge and connect the live footage to the Police headquarters and the Township website. This will be a collaborative effort with the Borough of Woodland Park.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Reduction in flood response requirements, Public information, quicker response to flooding
Useful Life:	10 years	**Goals Met:**	1, 2, 3
Estimated Cost:	$10,000	**Mitigation Action Type:**	Local Plans and Regulations, Education and Awareness Programs
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 month	**Potential Funding Sources:**	Township budget, private grant opportunities, PDM, FMA
Responsible Organization:	Police Department, OEM, Department of Public Works, Borough of Woodland Park	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning, Flood Warning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Post emergency staff at bridge	Staff time	Removes staffing capability elsewhere
	Increase resilience of stream gauges to prevent failure	$10,000	Still includes a lag

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Flood Cameras	
Project Number:	2020-Little Falls-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will result in less chance of flood exposure
Property Protection	1	Cameras will allow movable property to be moved as flooding begins (cars)
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	Within 2 years
Agency Champion	1	Police Department, Department of Public Works, Woodland Park, OEM
Other Community Objectives	1	Community education
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Peckman River Flood Tunnel		
Project Number:	2020-Little Falls-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Heavy rainfall results in the Peckman River overflowing its banks. Flooding impacts neighborhoods in Township of Little Falls and Borough of Woodland Park, including businesses.		
Action or Project Intended for Implementation			
Description of the Solution:	The USACE will construct a double box diversion culvert, or tunnel structure to be built under roadways to divert floodwater from the Peckman River into the Passaic River. Proposed project aspects include: • A 1,500-foot-long, 40-foot diameter double box diversion culvert would be constructed between the Peckman and Passaic rivers to divert floodwater from the Peckman into the Passaic River. • Approximately 2,170 linear feet of levees and/or floodwalls. • An additional 1,207 linear feet of levees and/or floodwalls would be constructed in the vicinity of Little Falls High School, between the track and baseball fields. • As many as 16 structures would be elevated so their main floor elevations would be to a final height of one foot above the base flood elevation. • As many as 38 structures to be wet floodproofed and four structures to be dry floodproofed.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	To be determined by completed project design	**Estimated Benefits (losses avoided):**	Reduction in flooding of neighborhood and businesses
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	$172 million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	USACE
Responsible Organization:	USACE, Township of Little Falls, Borough of Woodland Park	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Buyout all properties that could be impacted by flooding	$250,000 per property	Unlikely to buyout all properties
	Increase warning time by increasing warning systems	$50,000	Lives and property still at risk

Progress Report (for plan maintenance)	
Date of Status Report:	

Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Peckman River Flood Tunnel	
Project Number:	2020-Little Falls-010	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect lives from flooding
Property Protection	1	Project will protect homes and businesses from flooding
Cost-Effectiveness	1	
Technical	1	The USACE has developed plans for the project
Political	1	There is public support for the project
Legal	1	
Fiscal	1	The project could be supported by USACE funds
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	Within 3 years
Agency Champion	1	USACE, Township of Little Falls, Borough of Woodland Park
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Upgrade Fairfield Pump Station		
Project Number:	2020-Little Falls-011		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The Fairfield Pump Station is located in the 100-year floodplain and needs to be upgraded. The Pump Station also requires increased capacity.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will upgrade the Fairfield Pump Station from a 10,000 GPM to a 25,000 GPM and elevate the facility.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	100-year flood	**Estimated Benefits (losses avoided):**	Increased capacity and reduction in flood risk.
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	Within 1 year	**Potential Funding Sources:**	Township budget, HMGP, FMA, PDM
Responsible Organization:	Engineering	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate but do not increase capacity	$30,000	Still under capacity needed
	Relocate pump station	$200,000	Pump station needs to remain in current location

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Upgrade Fairfield Pump Station	
Project Number:	2020-Little Falls-011	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protects pump station from flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support for the project
Legal	1	
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	Within 1 year
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

9.7 BOROUGH OF NORTH HALEDON

This section presents the jurisdictional annex for the Borough of North Haledon. The annex includes a general overview of the Borough; an assessment of the Borough of North Haledon's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.7.1 Hazard Mitigation Planning Team

The following individuals are the Borough of North Haledon's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.7-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Assistant Chief Todd Darby, Assistant Chief/OEM Coordinator 103 Overlook Ave., North Haledon, NJ 973-800-3649 tdarby@northhaledonnj.com	Lt. Anthony Conforti, Lt./Asst. OEM Coordinator 103 Overlook Ave., North Haledon, NJ 973-715-8888 aconforti@northhaledonnj.org
NFIP Floodplain Administrator	
Phillip Chef, FPA/Construction 103 Overlook Ave., North Haledon, NJ 973-423-9422 xpjcx@aol.com	

9.7.2 Jurisdiction Profile

Along with the Township of Wayne, City of Paterson and Boroughs of Totowa, Hawthorne, Prospect Park and Haledon, the Borough of North Haledon was formed from Manchester Township and incorporated as an independent borough in 1901 (Snyder, 1969). North Haledon adopted the Borough form of government in 1901 and is governed by a mayor and six-person council.

According to the U.S. Census Bureau, the Borough has a total land area of 3.498 square miles, of which 3.454 square miles is land and 0.044 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of North Haledon was 8,417. The estimated 2017 population was 8,564, a 1.7 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 2.9 percent of the population is 5 years of age or younger and 24 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.7.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.7-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.7-1 and 9.7-2at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development.

Table 9.7-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	0	0	4	38	3
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	1	1	2	7	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Belmont Estates	Residential	34 structures	940 Belmont	None	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Belmont Acquisitions	Residential	180 structures	920 Belmont	None	Proposed
Mountain Falls	Residential	50 units in five buildings	987 Belmont Ave.	Moderate Wildfire	Pending
Andy's Court	Residential	3 structures	Block 22, 7, 7.02; 176 Oakwood Ave.	Low Wildfire	Proposed

** Only location-specific hazard zones or vulnerabilities identified.*

9.7.4 Capability Assessment

The Borough of North Haledon performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in the Capability Assessment below. The Borough of North Haledon identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of North Haledon.

Table 9.7-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State &Local	Yes	-	-
Comment: *State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.); Chapter 240 - Uniform Construction Codes which is enforced by the Construction Official.*					
Zoning Code	Yes	Local	Yes	Yes	-
Comment: *Chapter 600 – last amended 9/19/2018; the code includes specifications for each specific zone including flood, steep grades and impervious surfaces. Any development in the zoning areas must be serviced by a stormwater management system that must conform to all relevant federal and state statutes, rules, regulations concerning stormwater management or flood control. Depending on the zoning area, there are different impervious surface requirements.*					
Subdivisions	Yes	Local	Yes	Yes	-
Comment: *Chapter 530, last amended June 2014, the purpose of this chapter is to provide rules, regulations and standards to guide land subdivision in the Borough in order to promote its public health, safety, convenience and general welfare. It shall be administered to ensure orderly growth and development, conservation, protection and proper use of land and adequate provision for circulation, utilities and services. No person shall subdivide or annex lands in the Borough without first having secured the approval of the Planning Board of the Borough. Final plats presented to the Planning Board must show rights-of-way required for widening existing streams and for providing future floodway areas, with accurate dimensions and bearings and other necessary engineering data*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *Chapter 516 (Stormwater Management), adopted by the Borough on 2/21/2007 – the purpose of this chapter is to establish minimum stormwater management requirements and controls for major development. The policy statement for this chapter is: flood control, groundwater recharge, and pollutant reduction through nonstructural or low-impact techniques shall be explored before relying on structural BMPs. This chapter applies to all site plans and subdivisions for major developments that require preliminary or final site plan or subdivision review. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards.* • *Chapter 519 (Stormwater Quality), last amended on 12/2/2009 - the purpose of is to prohibit the spilling, dumping or disposal of materials other than stormwater to the municipal separate storm sewer system (MS4) operated by the Borough of North Haledon so as to protect public health, safety and welfare and to prescribe penalties for the failure to comply.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State, **Division of Consumer Affairs**	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	-	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	Yes	-
Comment: *Chapter 490, last amended 10/15/1996 – this chapter serves as the site plan review and approval ordinance for the Borough. Site plan review is required before any change of use or before any excavation, removal of soil, clearing of a site or placing any fill on lands contemplated for development. No building permit is issued for any building or use or reduction or enlargement in size or other alteration of any building or change in use of any buildings. When conducting a site plan review, the reviewing board has several considerations including: storm drainage, sanitary waste disposal, water supply and garbage disposal shall be reviewed and considered. particular emphasis shall be given to the adequacy of existing systems and the need for improvements, both on site and off site, to adequately carry runoff and sewage and to maintain an adequate supply of water at sufficient pressure; and environmental elements relating to soil erosion, preservation of*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
trees, protection of watercourses and resources, noise, topography, soil and animal life shall be reviewed, and the design of the plan shall minimize any adverse impact on these elements.					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 430 (Parks and Recreation)* • *Chapter 570 (Trees) - The purpose of this chapter is to control and regulate indiscriminate and/ or excessive removal, cutting and/or destruction of trees and to control, regulate and/or prevent conditions which cause increased surface drainage, sedimentation and/or soil erosion, cause decreased soil fertility and/or impair the stability and/or value of real estate, all of which conditions are and will in the future be a deterrent to public safety, health and welfare. Tree removal from any slope or environmentally sensitive area is prohibited if it will contribute, in the opinion of the Planning Board, the Construction Official or the Borough Engineer, to extra runoff of surface water onto adjoining property and erosion and silting, unless other means approved by the Passaic County Soil Conservation District are provided to prevent runoff and erosion.*					
Flood Damage Prevention	Yes	Local, State	Yes	Yes	-
Comment: *Chapter 307 June 2014 Flood Damage Prevention - adopted by the mayor and council on 8/15/2007; amended in 2020; designates the Construction Official as the Local administrator; It is the purpose of this chapter to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas. The ordinance provides specific standards for flood hazard reduction including new construction and substantial improvement requirements for residential and non-residential structures. This include requiring buildings to be elevated at least one foot above the BFE.. .*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes, Reexamination March 26, 2011	Local	Yes	Yes	-
Comment: *The 2004 Master Plan has several goals that align with or are similar to the current HMP goals: provide for the proper use and development of all lands in the Borough; provide adequate park, recreation, and open space areas; preserve the remaining environmentally sensitive lands. The plan also describes the topography, soil, water bodies, wetlands, and floodplains found in the Borough. The 2011 reexamination plan includes steeply sloped areas and stream corridor areas continue to be preserved and protected by both the Borough Council and Borough Planning Board. Additionally, the Borough enforces steep slope regulations, which regulate development on lands with slopes of 8% or more.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *This is included in the annual budget and covers three years. The 2019 budget included capital improvement funds for road improvements. The annual budget includes hazard-related funds for snow removal, and property maintenance.*					
Disaster Debris Management Plan	No	-	-	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					
Floodplain or Watershed Plan	No	-	-	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: *Boswell Engineering maintains the Stormwater Management Plan for the Borough. The Plan was last revised in June 2007 and documents the strategy for the Borough to address stormwater-related impacts. The Plan addresses groundwater recharge, stormwater quantity and stormwater quality impacts by incorporating stormwater design and performance standards for new major developments, defined as projects that disturb one or more acres of land or increasing impervious surface by one-quarter acre. These standards are intended to minimize the adverse impact of stormwater runoff on water quality, water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The goals of the plan coincide with that of the County's HMP and focus on reducing flood damage, reduce soil erosion, and protect life and safety.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: *Boswell Engineering maintains the Stormwater Management Plan for the Borough. The Plan was finalized in April 2018. The plan indicates that the Planning and Zoning Boards ensure that all residential development and redevelopment comply with RSIS before issuing any permits. The DPW is responsible for maintaining and operating all Borough-owned BMPs. During Borough events, stormwater management information and educational materials are distributed to the public.*					
Urban Water Management Plan	No	-	-	-	-
Comment:					
Habitat Conservation Plan	No	-	-	-	-
Comment:					
Economic Development Plan	No	-	-	-	-
Comment:					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	No	-	-	-	-
Comment:					
Community Forest Management Plan	No	-	-	-	-
Comment:					
Transportation Plan	Yes - part of Master Plan	County and Local	No	-	-
Comment:					
Agriculture Plan	Yes - part of Master Plan	Local – Borough Planning Board	No	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Business Development Plan	Yes	Local – Borough Planning Board	No	-	-
Comment:					
Other	No	-	-	-	-
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes - updated in 2018	Local – Emergency Management	Yes	-	-
Comment:					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	-	-	-
Comment:					
Continuity of Operations Plan	No	-	-	-	-
Comment:					
Public Health Plan	Yes	Local – Borough Health Office	No	-	-
Comment:					
Other	No	-	-	-	-
Comment:					

Table 9.7-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes - Borough engineer has the capability to do this
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes - has the ability through the Building Department, Zoning Board and Planning Board

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of North Haledon.

Table 9.7-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	The Borough Planning Board is responsible for preparing the master plan of growth and development, natural resources, transportation, housing, etc. identifying specific geographic zones and delineating the permitted types of development in each zone consistent with NJ State Statutes. This process includes drafting, having public hearings, and making recommendations to the Borough Council on the adoption of Zoning Ordinances. They also hear development applications for permitted uses and makes recommendations regarding the applications to ensure both State law and local standards are met.
Mitigation Planning Committee	Yes	Various Departments
Environmental Board / Commission	Yes	Green Team members are officially appointed each year at the Borough's Reorg meeting held on the first Monday of each year. Green Team efforts are also aided by North Haledon's Municipal and Deputy Clerks and North Haledon's DPW staff. The Green Team partners with other community groups and assigns its members to liaise with respective partners and collaborate with the partners to advance Sustainable Jersey eligible projects.
Open Space Board / Committee	No	
Economic Development Commission / Committee	No	
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle, social media and reverse 911 (through the county). The Borough's website provides recent news and upcoming events on the main page. They also provide updates on hazard events and emergencies. For residents with disabilities, the Borough encourages them to sign up on register ready to help emergency responders respond properly during a disaster or emergency. The Borough uses Nixle to rely emergency information to residents.
Maintenance program to reduce risk	No	
Mutual aid agreements	Yes	The Borough has mutual aid agreements in place with surrounding neighborhoods and the County. The Mayor and OEM Director are responsible for maintaining the agreements.
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Boswell Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Boswell Engineering
Planners or engineers with an understanding of natural hazards	Yes	Boswell Engineering
Staff with training in benefit/cost analysis	No	
Staff with training in green infrastructure	Yes	Green Team – this is a volunteer group in the Borough that offers residents and the community educational opportunities throughout the year to sustain a healthy community.
Staff with education/knowledge/training in low impact development	Yes	Police Department and OEM
Surveyor	No	

Staff/Personnel Resource	Available?	Department/Agency/Position
Stormwater engineer	Yes	Boswell Engineering - contracted by Borough
Personnel skilled or trained in GIS applications	No	
Local or state water quality professional	Yes	Boswell Engineering - contracted by Borough
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Todd Darby, NHPD
Watershed planner	No	
Environmental specialist	Yes	Boswell Engineering - contracted by Borough
Grant writers	No	
Resilience Officer	Yes	Police Department
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of North Haledon.

Table 9.7-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of North Haledon.

Table 9.7-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - Chief of Police and Borough Mayor
Do you have personnel skilled or trained in website development?	Yes - contractor to build and monitor the website; Borough maintains and updates website
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes - Municipal website and social media
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes - Facebook and Nixle
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes Green Team - citizen based group

Criterion	Response
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes municipal website, mailing, Nixle, reverse 911, staff on foot (police and fire)
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes – Nixle and Register Ready

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of North Haledon.

Table 9.7-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	4	2012
Public Protection (Fire ISO Protection Class)	No		
Storm Ready Certification	No		
Firewise Community Classification	No		
Sustainable Jersey	Yes	Bronze	10/9/2017

ADAPTIVE CAPACITY

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes - state climatologist, county OEM, NJDEP, and NOAA
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	Yes

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.7-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes – Boswell Engineering
What is the date that your flood damage prevention ordinance was last amended?	February 19, 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets the minimum and requires new development and substantial improvements in the SFHA to be elevated one foot above the BFE
When was the most recent Community Assistance Visit or Community Assistance Contact?	N/A
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? • If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	29 $7,900,100 $23,658
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	13 5 $46,281.05
Do you maintain a list of properties that have been damaged by flooding?	Yes - but minimal flooding in the Borough
Do you maintain a list of property owners interested in flood mitigation?	No

ADDITIONAL AREAS OF EXISTING INTEGRATION

- **Master Plan Reexamination Report (2011):** A main concept for the goals of the original 2004 Master Plan, and subsequent reexamination, is the protection and preservation of the natural resources and environmentally sensitive lands within the Borough. As one of its recommendations, the Borough proposed to apply for Sustainable Jersey Certification. Certified communities are eligible for funding for mitigation and sustainability projects.

- The following mitigation actions were enacted or proposed as a means to achieve these goals:
  - Storm water Management Plan
  - Initiate sustainable water practices, which include reducing potable water contamination and incorporating "gray-water" irrigation
  - Steep slope regulations
  - Sustainable Jersey certification
  - Implementation of a Sustainability Master Plan
- **Storm water Management Plan (2005):** The Borough's Storm water Management Plan addresses the potential risks due to increased storm water runoff from major new developments and outlines design and performance standards for storm water management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. The Plan outlines proposed changes to the Borough's Master Plan and zoning ordinances, as well as providing types of mitigation projects for new developments to implement.
- **Ordinances:** The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of North Haledon website at http://www.northhaledon.com/ for further information.
- **Outreach:** On their website, the Borough publishes information about upcoming events, important news stories for the community, and other public notices. The website also allows residents to sign-up and receive text message and e-mail alerts from the North Haledon Police Department and other public safety agencies. http://www.northhaledon.com/
- **Climate Adaptation – Flooding Risk**: The Borough of North Haledon recognizes the vulnerability of their community due to climate change. Long term resiliency necessitates adaptation, awareness and action. North Haledon is in the process of moving forward towards resiliency through the Climate Adaptation: Flooding Risk Action requirements. This action will not only prepare the Borough of North Haledon for climate change, but will educate citizens and decision makers on the changes needed to ensure a safer and more livable place for all North Haledon residents today and in the future.

9.7.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of North Haledon's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.7-10 provides details regarding municipal-specific loss and damages the Borough of North Haledon experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.7-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed.	No damages or losses reported by the Borough
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County.	No damages or losses reported by the Borough
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	No damages or losses reported by the Borough

9.7.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.7-11 summarizes the Borough risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.7-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	8,564	100-year MRP Hurricane:	2,698	100-year MRP Hurricane:	$935,762	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	0	NEHRP D&E:	0	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$401,113	
						2,500-year MRP building damages/loss:	$6,340,289	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,075	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	248			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	87	1% annual chance	30	1% annual chance	$1,390,394	High
		0.2% annual chance	121	0.2% annual chance	73			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	54	Class A:	19	Class A:	$13,404,428	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	7	Number of buildings the hazard area:	3	Replacement cost value of buildings located in the hazard area:	$10,250,896	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of North Haledon.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2018
Note: The number of SRL properties excludes RL properties.

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.7-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Municipal Building	EOC	X	X	Structure is not in the floodplain; confirmed on the flood map

Additional Identified Vulnerabilities

According to the 2007 Flood Insurance Study (FIS) for Passaic County, flooding from Molly Ann Brook affects the Borough of North Haledon. The Borough experiences moderate flooding in the area adjacent to High Mountain Road. Streams in the Borough exhibit potential bank degradation and erosion due to high velocity flows in the steep channels (FEMA FIS 2007).

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of North Haledon that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of North Haledon has significant exposure. Refer to Figures 9.7-1 and 9.7-2.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of North Haledon. The Borough of North Haledon has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of North Haledon adjusted the ranking of coastal storm from high to medium.

Table 9.7-13. Borough of North Haledon Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Medium	Low	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Low	Medium	Medium	Medium	Medium	Medium	Low

9.7.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.7-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Ensure continuity of operations at critical facilities. At this time, the following has been identified: Purchase portable power supply for Municipal Building and Police Department	OEM	Complete – portable generator was purchased with FEMA funding	-	-
Enlarge and replace existing culvert at Harring Court	Engineer	No Progress/Discontinue – while the Borough had intentions of doing this project, the Borough cannot complete this project because there is a secondary entrance to Harring Court that allows access to the homes on this road	-	-
Replace Gabion Walls at 845 Belmont Ave/Buttermilk Falls	Engineer	Complete – the work has been completed. The area has been monitored during recent storm events and there have been no damages related to storm events.	-	-
Replace Stream retaining walls at 936 High Mountain Road (residential property)	Engineer	Discontinue – the homeowner has done some work on their property; therefore, this action will not be included in the 2020 update	-	-
Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what citizens can do in the way of mitigation and	OEM	Ongoing Capability - Borough is currently doing this work – provide flyers, informational brochures, etc. in print at police headquarters and Borough Hall and Facebook page	-	-

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
preparedness, including flood insurance. This program will include: - Providing general natural hazard risk, preparedness and mitigation, and related NFIP information in regular newsletter and mailings. - Including natural hazard risk and risk reduction information through social media channels and email blast systems. - Posting of flyers and other readily available NFIP informational materials at Borough Hall or distributing at regular civic meetings. - Preparation, distribution and analysis of public surveys. - Developing/maintaining a natural hazard risk management webpage on the municipal website where information and mapping can be posted. - Enhance public outreach to residents in NFIP floodplain areas to inform of annual grant opportunities, etc. which may include periodic articles and handouts.				
Install storm water management measures to include open space located athletic fields 103 Overlook Ave utilizing for drainage off property (potential subsurface storage under the ball fields for the new municipal building which is undersized/antiquated)	Engineer	Discontinue – this action will not be included in the 2020 update as it is not an issue in the Borough	-	-
Re-establish a vegetative buffer along 1,500 linear feet of the shoreline Yahn's Ponds as a goose control measure and to filter storm water runoff from the high goose traffic areas	Engineer	Complete – the Borough installed fountain/pump system to circulate water and installed rip rap along the shoreline	-	-
Provide goose management measures to include public education at the Borough's parks	Borough Engineer	Complete – the Borough has installed goose management measures throughout the Borough	-	-
Use the mitigation plan as a guide during the next Master Plan Update	OEM	Ongoing Capability	-	-
Stream bank stabilization along Molly Ann Brook; potential energy dissipation near Church Street/bridge	Borough Engineer	No Progress – this location is not in the Borough; therefore, it will not be included in the 2020 update	-	-

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of North Haledon participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of North Haledon participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards*

(January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.7-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of North Haledon would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the 4 FEMA mitigation action categories and the 6 CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.7-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-NORTH HALEDON-001	Relocating the Municipal Building	**Problem**: The Borough's Police Department is located in a low-lying area and could be surrounded by flood waters in a severe storm as the Molly Ann Brook could flow over Overlook Avenue to either side of the Municipal Building. The property is located in the floodplain; however, the building is not. During heavy rain events, the building sustains flood damage. Each time, the Borough has to relocate equipment to protect. The electrical panels and communications for the police department are located in the basement. If flooded, the system would not be functional. At this time, there is no options to relocated this equipment above ground. **Solution**: While the building itself is not located in a floodplain, during heavy rain, the police department portion of the municipal building sustains flood damage. The building cannot be elevated due to its age. The Borough will construct a new municipal building complex outside of the floodplain. This will protect the structure and contents from flood damages.	Existing	Flood	All	Borough Police and Administration	FEMA HMGP and FMA, Department of Justice grant	Increase resiliency, continuity of operations, reduce flood losses	$10 million+	5 years+	Medium	SIP	PP, ES
2020-NORTH HALEDON-002	Education and Outreach on Safe Generator Use	**Problem**: While the Borough has various education and outreach materials available to the community, there is limited information on the proper and safe use of generators residents may use during power outages.	N/A	Coastal Storm, Extreme Temperature, Flood, Severe Weather,	All	Borough OEM and Administration	Municipal Budget, FEMA PDM	Increase awareness of residents	$20,000	Within 4 years	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: Develop educational and outreach material to issue to residents on using generators during a power outage. This information will include how to use generators at home, what laws the Borough has in place for using generators, preventing carbon monoxide poisoning, and the types of hazards associated with generators.		Severe Winter Weather									
2020-NORTH HALEDON-003	Dry Floodproof the Police Department	**Problem**: The Borough's Police Department is located in a low-lying area and could be surrounded by flood waters in a severe storm as the Molly Ann Brook could flow over Overlook Avenue to either side of the Municipal Building. During heavy rain events, the building sustains flood damage. Each time, the Borough has to relocate equipment to protect. The electrical panels and communications for the police department are located in the basement. If flooded, the system would not be functional. At this time, there is no options to relocated this equipment above ground. **Solution**: Dry floodproof the police department portion of the municipal complex. Sealants will be applied to the walls where water typically enters the building during a flood event.	Existing	Flood, Coastal Storm, Severe Weather		Police Department	Municipal Budget	Continuity of operations, protects essential equipment	$25,000	Within 2 years	High	SIP	PP, ES

Notes:

Acronyms and Abbreviations: *Potential FEMA HMA Funding Sources:* *Timeline:*

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.7-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-NORTH HALEDON-001	Relocating the Municipal Building	1	1	1	1	1	1	0	0	0	1	0	0	1	0	8	Medium
2020-NORTH HALEDON-002	Education and Outreach on Safe Generator Use	1	1	1	1	1	1	1	0	1	1	1	1	1	0	12	High
2020-NORTH HALEDON-003	Dry Floodproof the Police Department	1	1	1	1	1	1	1	0	0	1	1	1	1	0	11	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.7-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storm		-003	-002		-003	-003		
Dam Failure								
Disease Outbreak								
Drought								
Earthquake								
Extreme Temperature			-002					
Flood		-001, -003	-002		-001, -003	-001, -003		
Geological Hazard								
Hazardous Substances								
Infestation and Invasive Species								
Severe Weather		-003	-002		-003	-003		
Severe Winter Weather			-002					
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.7.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of North Haledon followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.7-18. Contributors to the Annex

Entity	Title	Method of Participation
Lt. Anthony Conforti	Asst. OEM Coordinator and Lt Police	Attended meetings, provided input on annex, identified mitigation strategies
Assistant Chief Todd Darby	OEM Coordinator and Chief of Police	Attended meetings, provided input on annex, identified mitigation strategies

Entity	Title	Method of Participation
Phillip Chef	Construction Official and NFIP Floodplain Administrator	NFIP FPA; Reviewed the annex
Randy George	Mayor	Reviewed the annex
Renate Elatab	Borough Administrator	Reviewed the annex
Joe Pomante	Engineer	Reviewed the annex
Chris Bataglia	Fiscal/CFO	Reviewed the annex
Michael Kauker	Land Use Planner	Reviewed the annex
Bill Graham	Public Works Director	Reviewed the annex
Jimmy Booth	Fire Official	Reviewed the annex

Figure 9.7-1. Borough of North Haledon Hazard Area Extent and Location Map 1

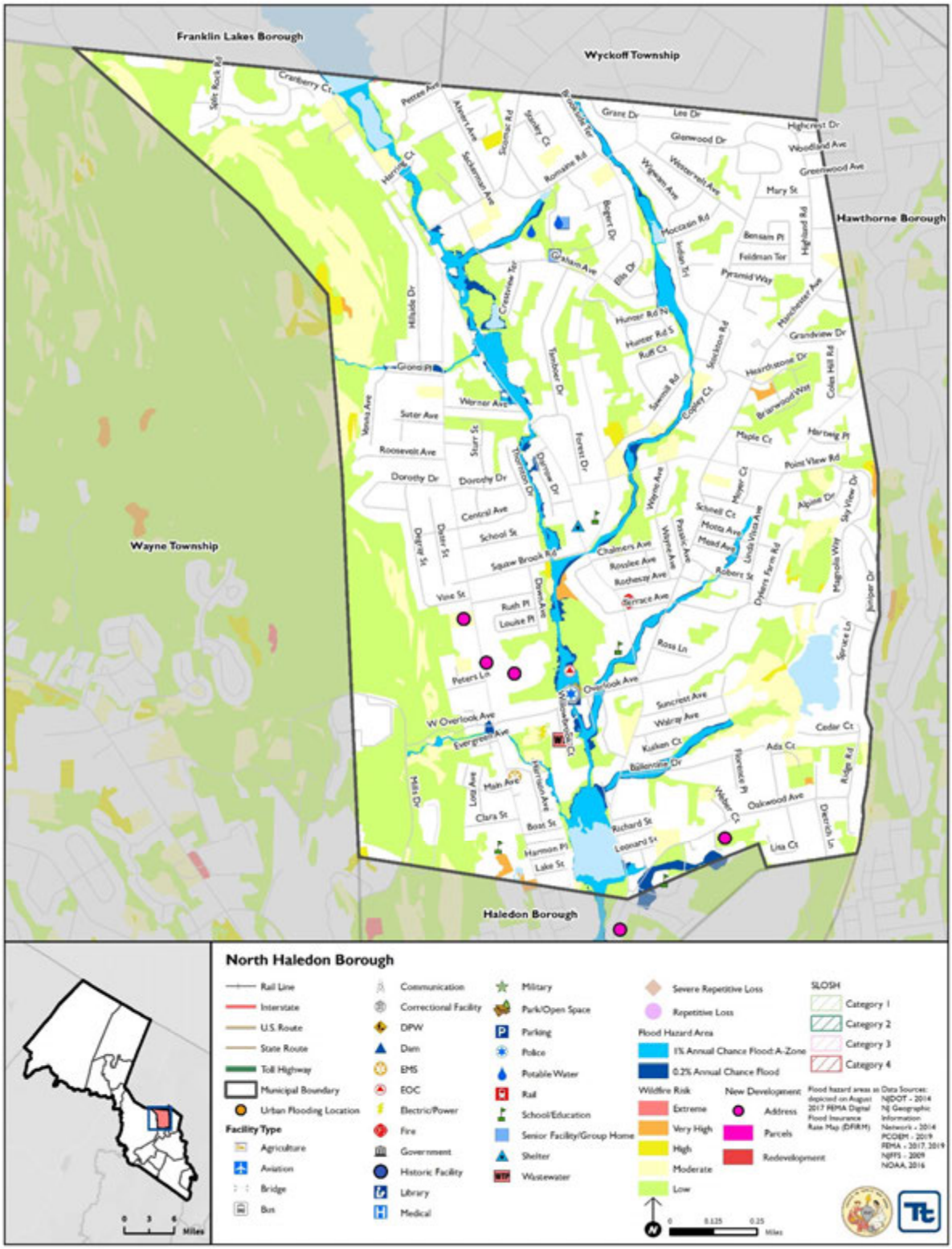
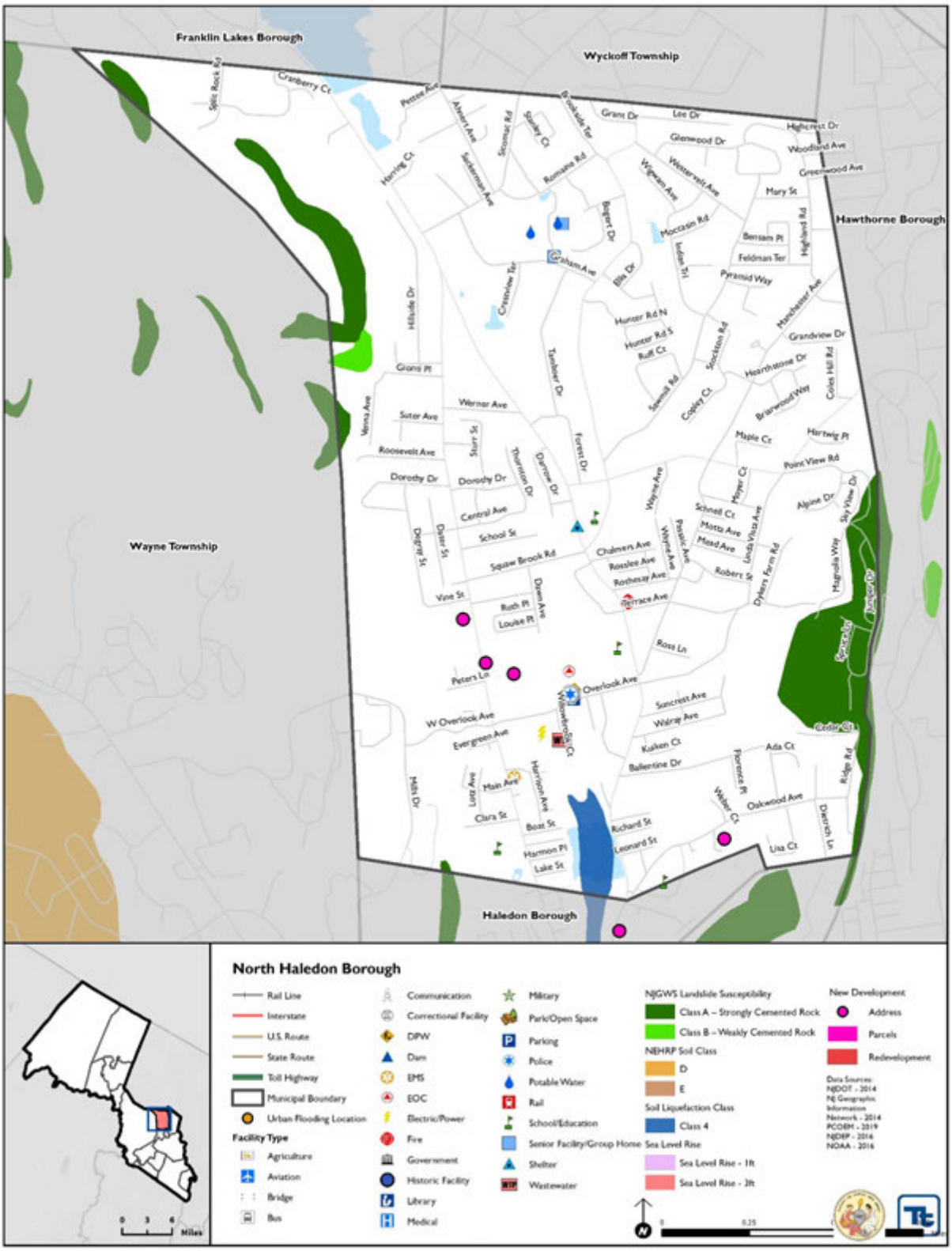


Figure 9.7-2. Borough of North Haledon Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Relocating the Municipal Building		
Project Number:	2020-NORTH HALEDON-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The Borough's Police Department is located in a low-lying area and could be surrounded by flood waters in a severe storm as the Molly Ann Brook could flow over Overlook Avenue to either side of the Municipal Building. The property is located in the floodplain; however, the building is not. During heavy rain events, the building sustains flood damage. Each time, the Borough has to relocate equipment to protect. The electrical panels and communications for the police department are located in the basement. If flooded, the system would not be functional. At this time, there is no options to relocated this equipment above ground.		
Action or Project Intended for Implementation			
Description of the Solution:	While the building itself is not located in a floodplain, during heavy rain, the police department portion of the municipal building sustains flood damage. The building cannot be elevated due to its age. The Borough will construct a new municipal building complex outside of the floodplain. This will protect the structure and contents from flood damages.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	100-year	**Estimated Benefits (losses avoided):**	Increase resiliency, continuity of operations, reduce flood losses
Useful Life:	50 years	**Goals Met:**	All
Estimated Cost:	$10 million+	`	SIP
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	5 years+
Estimated Time Required for Project Implementation:	5 years+	**Potential Funding Sources:**	FEMA HMGP and FMA, Department of Justice grant
Responsible Organization:	Borough Police and Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate building	$1 million+	Not feasible; building cannot be elevated; police vehicles will still be vulnerable to flood damage
	Install floodproof doors	~$10,000	Provides protection to the inside of the station but not any infrastructure outside the building

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Relocating the Municipal Building	
Project Number:	2020-NORTH HALEDON-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides continuity of operations of equipment to help residents
Property Protection	1	Protects equipment, essential services, and structure from flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	There is political support for this project
Legal	1	
Fiscal	0	Borough would need grant funding to complete
Environmental	0	
Social	0	
Administrative	1	Administrative support for this project
Multi-Hazard	0	Flood
Timeline	0	Long term project
Agency Champion	1	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

9.8 CITY OF PASSAIC

This section presents the jurisdictional annex for the City of Passaic. The annex includes a general overview of the City of Passaic; an assessment of the City of Passaic's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.8.1 Hazard Mitigation Planning Team

The following individuals are the City of Passaic's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.8-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Walter Porto, Passaic OEM Address: 11 Hope Avenue City of Passaic, NJ Phone Number: 973-703-9814 Email: oem-deputy@cityofpassaic.gov	Name / Title: Captain Piyush Patel, Police Department Address: 330 Passaic Street City of Passaic, NJ Phone Number: 973-365-3985 Email: ppatel@cityofpassaicnj.gov
NFIP Floodplain Administrator	
Name / Title: Dennis Harrington, City Engineer Address: 11 Hope Avenue City of Passaic, NJ Phone Number: 973-365-3985 Email: dharrington@cityofpassaicnj.gov	

9.8.2 Jurisdiction Profile

The area now known as the City of Passaic was settled by Dutch pioneers in 1678. The City became an independent municipality from Acquackanock Township in 1873. Due to its location on the Passaic River, the City population and development grew alongside the Industrial Revolution (Auerbach 1998).

The City is governed by the Mayor/Council form of government under the Faulkner Act. The City has one mayor and seven-person council (City of Passaic 2014).

According to the U.S. Census Bureau, the City has a total land area of 3.244 square miles, of which 3.146 square miles is land and 0.098 square miles is water.

According to the U.S. Census, the 2010 population for the City of Passaic was 69,781. The estimated 2017 population was 71,057, a 1.8 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 9.8 percent of the population is 5 years of age or younger and 8.3 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.8.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.8-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.8-1 and 9.8-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.8-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	0	0	0	0	0
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
MacDanold Brook Flood Control Project	Flood Control	N.A.	Third Ward Veteran's Memorial Park, Passaic Avenue	Flooding	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*

9.8.4 Capability Assessment

The City of Passaic performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.8.4). The City of Passaic identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the City of Passaic and where hazard mitigation has been integrated.

Table 9.8-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State, Local	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Administered by Building Department.*					
Zoning Code	Yes	Local	Yes	No	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Chapter 317: Zoning Adopted by the City Council of the City of Passaic 8-9-1984 by Ord. No. 796-84 and amended by Ord. 2000-14 adopted 9-23-2014. Administered by Zoning. The City of Passaic's Zoning Ordinance establishes the zoning plan for the City of Passaic for the protection and promotion of public health, safety, and welfare in the following manner listed below:* *•To encourage municipal action to guide the appropriate use or development of all lands in this City in a manner which will promote the public health, safety, morals and general welfare.* *•To secure safety from fire, flood, panic and other natural and man-made disasters.* *•To provide adequate light, air and open space.* *•To ensure that the development of this municipality does not conflict with the development and general welfare of neighboring municipalities, the county and the state as a whole.* *•To promote the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions and preservation of the environment.* *•To encourage the appropriate and efficient expenditure of public funds by the coordination of public development with land use policies.* *•To provide sufficient space in appropriate locations for a variety of residential, recreational, commercial and industrial uses and open space, both public and private, according to their respective environmental requirements, in order to meet the needs of all citizens of the City of Passaic.* *•To encourage the location and design of transportation routes which will promote the free flow of traffic while discouraging location of such facilities and routes which result in congestion or blight.* *•To promote a desirable visual environment through creative development techniques and good civic design and arrangements.* *•To promote the conservation of open space and valuable natural resources and to prevent urban sprawl and degradation of the environment through improper use of land.* *•To encourage planned developments which incorporate the best features of design and relate the type, design and layout of residential, commercial, industrial and recreational development to the particular site.* *•To encourage senior citizen community housing construction.* *•To encourage coordination of the various public and private procedures and activities shaping land development with a view of lessening the cost of such development and to the more efficient use of land.* *•To promote the conservation of energy through the use of planning practices designed to reduce energy consumption and to provide for maximum utilization of renewable energy sources.*					
Subdivisions	Yes	Local	Yes	No	-
Comment: *Chapter 263: Subdivision of Land. Adopted by the City Council of the City of Passaic 3-7-1985 as Ord. No. 832-85. Administered by Zoning.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Administered by the Construction Code Official. Municipal Stormwater Management Plan dated March 2005 revised November 2007. Chapter 258A by Ord. No.. 1755-08 Stormwater Control. Administered by City Council. The Stormwater Control Ordinance (Chapter 258A of the municipal code) establishes minimum stormwater management requirements and controls for major development.*					
Post-Disaster Recovery	Yes	Local	-	No	-
Comment: *See Flood Damage Prevention Chapter 143 by Ord. No. 1744-07 adopted 10-9-2007. Administered by Zoning and Engineering.*					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes	No	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *State mandated at local level. Identified in Master Plan and administered by Zoning.*					
Site Plan Review	Yes	State	Yes	No	-
Comment: *Chapter 29 Land Development Procedures. Administered by Zoning and Engineering.*					
Environmental Protection	Yes	State	Yes	No	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.*					
Flood Damage Prevention	Yes	Local	Yes	No	-
Comment*: City of Passaic Chapter 143 Flood Damage Prevention being adopted in March 2020. Administered by the City Engineer. The City of Passaic's Flood Damage Prevention Ordinance (Chapter 143 of the municipal code) was adopted to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* *•Protect human life and health;* *•Minimize expenditure of public money for costly flood control projects;* *•Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* *•Minimize prolonged business interruptions;* *•Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* *•Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* *•Ensure that potential buyers are notified that property is in an area of special flood hazard; and* *•Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					
Wellhead Protection	No	-	Yes	No	-
Comment:					
Emergency Management	Yes	Local	-	No	-
Comment: *Chapter 5-90 Administration of Government: Office of Emergency Management Services.*					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	Yes	Local	-	No	-
Comment: *Office of Emergency Management Services Amended 10-22-2013 by Ord. No. 1959-13. Administered by the OEM Director.*					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: *2013 Master Plan.*					
Capital Improvement Plan	Yes	Local	Yes	Yes	-
Comment: *Per NJSA 40:55D-29 the governing body is authorized to direct the planning board to prepare a CIP with at least a six year planning horizon. Capital Improvements are identified annually and administered by Administration.*					
Disaster Debris Management Plan	Yes	Local	Allowed	No	-
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	-	-
Comment: *Chapter 143 by Ord. No. 1744-07 Flood Damage Prevention adopted 10-9-2007. Administered by the City Engineer.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Stormwater Management Plan	Yes	Local	No	No	-
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). Municipal Stormwater Management Plan dated March 2005 revised November 2007. Chapter 258A by Ord. No.. 1755-08 Stormwater Control.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	No	-
Comment:					
Urban Water Management Plan	No	-	Yes	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	No	-
Comment: *Police Protocol-Road Closure. Administered by the Police.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	Local	No	No	-
Comment:					
Open Space Plan	Yes	Local	-	No	-
Comment: *Passaic City Recreation and Open Space Inventory Submitted to NDJEP January 29, 2003. Administered by State of NJ, Green Acres.*					
Snow Plan	Yes	Local	No	-	-
Comment: *The City of Passaic has a Snow Plan that identifies main arteries, priority main roads, and critical facility access roadways that are to be continuously addressed by the Department of Public Works during snow events.*					
Response/Recovery Planning					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	*Yes*	*Yes*	No
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. December 2019. The Emergency Management Plan is administered by OEM.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	Yes	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment: *Local Emergency Planning Council handles post disaster planning on a case by base.*					
Continuity of Operations Plan	Yes	Local	No	Yes	-
Comment: *Included as annex in EOP*					
Public Health Plan	Yes	Local	No	Yes	-
Comment: *Included as annex in EOP. Approved and created by Health Department.*					
Other	No	-	No	-	-
Comment:					

Table 9.8-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the City of Passaic.

Table 9.8-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Zoning
Mitigation Planning Committee	Yes	Mitigation Planning Committee
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Economic Development Commission / Committee	Yes	Urban Enterprise Zone
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Social media, website, police and fire with PA system, use of schools reverse 911
Maintenance program to reduce risk	Yes	Tree trimming, stormwater maintenance
Mutual aid agreements	Yes	Sanitary Sewer Maintenance
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Licensed Planner and Licensed Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Licensed Engineer
Planners or engineers with an understanding of natural hazards	Yes	Licensed Planner and Licensed Engineer
Staff with training in benefit/cost analysis	Yes	Engineering
Staff with training in green infrastructure	Yes	Engineering
Staff with education/knowledge/training in low impact development	Yes	Engineering
Surveyor	No	-
Stormwater engineer	No	-
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	Yes	Engineering
Emergency manager	Yes	OEM Director
Grant writers	Yes	Private consultants
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	Yes	Engineering
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the City of Passaic.

Table 9.8-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	No
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes, NJDOT Open Space
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	None

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the City of Passaic.

Table 9.8-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Public Information Officer
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes, some information which could be expanded on.
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Facebook, Twitter, and city website
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	No
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Social media, website, police and fire with PA system, use of schools reverse 911

Community Classifications

The table below summarizes the classifications for community programs available to the City of Passaic.

Table 9.8-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	-	-
Storm Ready Certification	Yes	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	none	6/03/2015

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.8-9. Adaptive Capacity of Climate Change

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes, if needed.
Is the administrative supportive of integrating climate change in policies or actions?	Yes

Criterion	Response
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms (*hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)*	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards (*landslides and subsidence/sinkholes*)	Medium
Hazardous Substances	Medium
Severe Weather (*high wind, tornado, TSTM, and hail*)	High
Severe Winter Weather (*heavy snow, blizzards, and ice storms*)	Medium
Wildfire	Medium

Notes:

High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;

Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

9.8.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the City made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Fire Department:** The City of Passaic's website includes a page for the Fire Department. This page includes educational information on winter storm and power outage preparedness
- **Planning Board:** The Planning Board is comprised of nine members and is responsible for administering the land development procedures established in Chapter 29 of the municipal code, reviewing site plans, and updating the Master Plan.
- **Zoning Board of Adjustment:** The Zoning Board of Adjustment is comprised of seven members and is responsible for hearing appeals, deciding requests for interpretation of the zoning map, and issuing permits.
- **Redevelopment Agency:** The Passaic Redevelopment Agency was created in 2002 for the purpose of carrying out the redevelopment plans of the City of Passaic. The agency is empowered to exercise public and essential government functions including: acquisition, condemnation, clearance, renovation, and

redevelopment of property in designated blight areas and to carry out redevelopment plans for the City of Passaic.

Opportunities for Future Integration

As this HMP update is implemented, the City will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.8-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2007
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	-
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
□ If so, what type of assistance/training is needed?	CFM training may be helpful
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Flood insurance policies: 484 Insurance in force: $108,657,200 Premium in force: $680,736
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 1,723 Claims still open or closed without payment: 216 Total payments for losses: $32,393, 166
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

Note: Policies and Claims from https://bsa.nfipstat.fema.gov/reports/1011.htm and https://bsa.nfipstat.fema.gov/reports/1040.htm as of 09/30/2018

9.8.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The City of Passaic's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.8-11 provides details regarding municipal-specific loss and damages the City experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.8-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6-7, 2018	Severe Winter Storm and Snowstorm (DR-4368)	Yes	A strong low-pressure system developed along the Middle Atlantic coast during the morning of Wednesday, March 7, 2018. The low tracked along the coast through the early morning hours on Thursday, March 8, 2018. The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey.	The storm resulted in downed trees, power outages, flooding in Benson Court area from Pennington to Main Avenue. $59,0000 FEMA reimbursement.
August 11, 2018	Flash Flooding	N/A	A stalled stationary boundary within a very moist airmass provided a focusing mechanism for several rounds of heavy rain that resulted in widespread flash flooding across northeast New Jersey. The Caldwell, NJ ASOS recorded 4.92 inches of rain, and multiple other stations across northeast New Jersey received between 2.5 inches and 4 inches of precipitation.	Flooding and evacuation of flooded areas was required.

9.8.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.8-12 summarizes the City of Passaic risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.8-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	71,057	100-year MRP Hurricane:	6,918	100-year MRP Hurricane:	$3,593,517	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	14,101	NEHRP D&E:	1,316	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	2,375	Liquefaction Class 4:	164	500-year MRP building damages/loss:	$1,508,797	
						2,500-year MRP building damages/loss:	$24,818,363	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	5,914	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	23,520			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	796	1% annual chance	67	1% annual chance	$8,408,237	High
		0.2% annual chance	3,509	0.2% annual chance	336			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	257	Class A:	0	Class A:	$0	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	1	Replacement cost value of buildings located in the hazard area:	$3,993,880	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the City of Passaic.

- Number of repetitive loss (RL) properties: 10
- Number of severe repetitive loss (SRL) properties: 1
- Number of RL/SRL properties that have been mitigated: None

Source: FEMA March 2019
Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.8-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Number 8, Pulaski E.S., 140 Street	School	X	X	2020-Passaic-011

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- High Street Culvert needs to be replaced.
- Passaic and Van Houten underpass floods with up to 6 feet of flooding during rainfall events.
- Areas between the Passaic River, 11th Street, half of 10th Street, Benson and Main, Howard and Main, Broadway and Main, Passaic and Columbia, Passaic and Canale Street are flood prone.
- The City needs space for snow storage during winter storm events.
- Flood insurance rates are rising and remapping may result in an increased need for flood insurance.
- The City would like a flood warning system/siren in place.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the City of Passaic that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the City of Passaic has significant exposure. Refer to Figures 9.8-1 and 9.8-2.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk

to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the City of Passaic. The City of Passaic has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

Table 9.8-14. City of Passaic Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Low	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Medium	Medium	Medium	Medium	Medium	Low

9.8.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.8-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Passaic – 1: Obtain backup power (e.g., generators) to ensure continuity of operations at critical facilities and to assist vulnerable populations: Mobile generators to assist medically-vulnerable populations	City of Passaic	Complete		
Passaic – 2: Update municipal codes as required	City of Passaic	No Progress	X	2020-Passaic-010
Passaic – 3: Continue to conduct public outreach and inform the public using channel 77 cablevision	Borough	Complete		
Passaic – 4: Tie the Hazard Mitigation Plan into the Master Plan redevelopment/revitalization	City of Passaic	Complete		
Passaic – 5: Develop all hazards public education and outreach program for hazard mitigation and preparedness	City of Passaic	Complete		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Passaic – 6: Establish a secondary boat ramp south of Union Avenue Bridge to assist with water rescue and water access in the Passaic River during high tide/storm events.	Fire Department	Complete		
Passaic – 7: Inspect all roofs, masonry, and windows for leakage at City Buildings	Engineering	In Progress	X	2020-Passaic-003
Passaic – 8: Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress). Properties identified at this time include four repetitive loss properties on Henry Street. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	Complete		
Passaic – 9: This project involves four phase of work on the MacDonald Book, encompassing 7,000 feet of Stream channel, bound by Park Road on the upstream end and the confluence of the MacDonald Brook with the Passaic River at the downstream end. The majority of the project is located within Memorial Park and is surrounded by residential areas. It is a Flood Control Project that evaluates the hydrologic and hydraulic condition in order to initiate appropriate improvements to waterways, structures and dams in order to reduce the frequency and intensity of flooding both within and adjacent to the project area.	City of Passaic	In Progress	X	2020-Passaic-004

In addition to the above progress, the City of Passaic identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The City has resource centers in place for warming and cooling centers.
- Public Services has been proactive with tree trimming and participate in the Community Forestry Program.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The City of Passaic participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The City of Passaic participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.8-16 summarizes the comprehensive-range of specific mitigation initiatives the City of Passaic would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.8-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Passaic-001	Pennington Avenue culvert	Benson Court, under Pennington Avenue floods.	Replace Pennington Avenue Culvert.	Existing	Severe Storm, Flood	1, 2	County	County, CDBG	Reduction in flooding	Part of $5 million	Short (2021)	High	SIP	SP
2020-Passaic-002	Repetitive Loss Outreach	The City has 10 repetitive loss properties and one severe repetitive loss property. The City has previously conducted outreach but property owners were not issued.	The City will revisit outreach to the repetitive loss properties; inquire about the preferred mitigation action (elevation/acquisition) and compile a list of property owners interested in applying for a grant. The City will develop a FEMA FMA grant application to mitigate theses properties.	Existing	Flood	1, 2	FPA	City budget for outreach, PDM, FMA	Reduction in flood damages	$2M	With 5 years	High	EAP	PI
2020-Passaic-003	Strengthen infrastructure at city buildings	Infrastructure at City buildings may be outdated and prone to damages.	Inspect all roofs, masonry, and windows for leakage at City Buildings	Existing	Severe Storm, Severe Winter Storm	1, 2, 6	Engineering	Municipal budget	Strengthened government structures	$10,000	Short	High	SIP	PP
2020-Passaic-004	McDonalds Brook Flood Control Project	Veterans Memorial Park is impacted by the long term effects of repeated	McDonalds Brook Flood Control Project has been completed through Phase 5.	N/A	Severe Storm, Flood	1, 2	County and Engineering	CDBG, NJDEP, Passaic County Open Space,	Planting of trees, stabilization of	$5 million	Short	High	NSP	NR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		flooding in the 50-acre park, which include significant damage to public open space, safety concerns, and environmental issues in McDonalds Brook and Hughes Lake.	The city will continue with the project.					Green Acres	brook, restoration of Hughes Lake, reduction in frequency/intensity of flooding.					
2020-Passaic-005	Passaic and Van Houten underpass flooding	Underpass flooding of up to 6 feet results in closures of roadway, damaged cars, and emergency response.	Conduct feasibility assessment to determine cause of flooding and appropriate mitigation actions. Complete actions once identified. Increase frequency of stormwater system cleaning.	Existing	Severe Storm, Flood	1, 2	Engineering	FMA, PDM	Reduction in flooding	TBD by feasibility assessment	Within 5 years	High	SIP	SP
2020-Passaic-006	Flood insurance promotion	Flood insurance rates are rising and remapping may result in increase in need for flood insurance.	Encourage residents to purchase flood insurance through outreach.	Existing	Flood	3	FPA	Municipal budget	Increase in flood insurance participation.	$500	Within 6 months	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Passaic-007	Consider CRS participation	Flood insurance rates are rising and remapping may result in increase in need for flood insurance.	The city will consider participation in the Community Rating System and join if warranted/	New and Existing	Flood	4, 5	FPA	Municipal budget	Decrease in flood insurance premiums	TBD	Within 1 year	High	LPR	PR, PI
2020-Passaic-008	Identify locations for snow storage	Heavy snowfall events result in need for snow storage to keep roadways open.	The city will identify potential locations for snow storage and secure sites.	N/A	Severe Winter Storm	5, 6	Public Works, Administration	Municipal budget	Roads kept clear during and after snow events	TBD by site selection	Within 1 year	High	LPR	PR, ES
2020-Passaic-009	Flood study for flood prone areas	Benson and Main, South and 10, and South and 11 are flood prone. South and 10 and South and 11 are impacted by riverine flooding.	The city will conduct flood studies at the flood prone locations to determine the cause of flooding and potential mitigation actions. The city will then carry out the selected identified actions. Could potentially build retaining wall or do stormwater improvements	New and Existing	Severe Storm, Flood	4	FPA, Engineering	PDM, FMA, BRICK	Reduction in flooding	$30,000 for flood studies	Within 5 years	High	SIP, LPR	PP
2020-Passaic-010	Update municipal codes	The City has municipal codes which may be updated to reflect best	The City will review ordinances and update as necessary to	New and Existing	All hazards: All Hazards:	1, 2, 5	Administration	City budget	Increased standards and	Staff time	Within 1	Medium	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		management practices for mitigation.	incorporate hazard mitigation.		Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological, Hazardous Substances, Infestation and Invasive Species, Severe Weather, Severe Winter Weather, Wildfire				integration		year			
2020-Passaic-011	Conduct flood outreach to Pulaski Elementary School	The Number 8, Pulaski E.S., on 140 Street is located in the 100-year floodplain. The school is owned and operated by the Board of Education.	The FPA will conduct outreach to the Board of Education to discuss flood exposure and possible mitigation actions.	Existing	Flood	3	FPA, Board of Education	City budget for outreach, PDM/FMA/HMGP for mitigation	Educate facility operator, potential mitigation	$200	Within 6 months	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
									action s will reduce flood risk					

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.8-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Passaic-001	Pennington Avenue culvert	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13	High
2020-Passaic-002	Repetitive Loss Outreach	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2020-Passaic-003	Strengthen infrastructure at city buildings	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Passaic-004	Continue to support McDonalds Brook Flood Control Project	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13	High
2020-Passaic-005	Passaic and Van Houten underpass flooding	1	1	1	1	1	0	0	1	1	1	1	0	1	1	11	High
2020-Passaic-006	Flood insurance promotion	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2020-Passaic-007	Consider CRS participation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic-008	Identify locations for snow storage	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Passaic-009	Flood study for flood prone areas	1	1	0	1	1	1	0	1	1	1	0	0	1	1	10	High
2020-Passaic-010	Update municipal codes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Passaic-011	Conduct flood outreach to Pulaski Elementary School	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.8-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	2020-Passaic-010							
Dam Failure	2020-Passaic-010							
Disease Outbreak	2020-Passaic-010							
Drought	2020-Passaic-010							
Earthquake	2020-Passaic-010							
Extreme Temperature	2020-Passaic-010							
Flood	2020-Passaic-007, 2020-Passaic-010	2020-Passaic-009	2020-Passaic-002, 2020-Passaic-006, 2020-Passaic-007, 2020-Passaic-011	2020-Passaic-004		2020-Passaic-001, 2020-Passaic-005		
Geological Hazards	2020-Passaic-010							
Infestation and Invasive Species	2020-Passaic-010							
Hazardous Substances	2020-Passaic-010							
Severe Weather	2020-Passaic-010	2020-Passaic-003, 2020-Passaic-009		2020-Passaic-004		2020-Passaic-001, 2020-Passaic-005		
Severe Winter Weather	2020-Passaic-008, 2020-Passaic-010	2020-Passaic-003			2020-Passaic-008			
Wildfire	2020-Passaic-010							

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.8.9 Staff and Local Stakeholder Involvement in Annex Development

The City of Passaic followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.8-19. Contributors to the Annex

Entity	Title	Method of Participation
Walter Porto	Passaic OEM	Primary POC, attended plan participant meetings, provided impact data, contributed to mitigation strategy
Fred Corbitt	Assistant Superintendent of DPW	Attended plan participant meetings, provided impact data, contributed to mitigation strategy
Dennis Harrington	City Engineer	Attended plan participant meetings, provided impact data, contributed to mitigation strategy
Omar Garcia	Assistant Director of Finance	Attended plan participant meetings, provided impact data, contributed to mitigation strategy
Amada Curling	City Clerk	Attended plan participant meetings, provided impact data, contributed to mitigation strategy
Hector C. Lora	Mayor	Reviewed annex
Ricardo Fernandez	Business Administrator/Land Use Planner	Reviewed annex
Luis Sanchez	Fire Official	Reviewed annex

Figure 9.8-1. City of Passaic Hazard Area Extent and Location Map 1

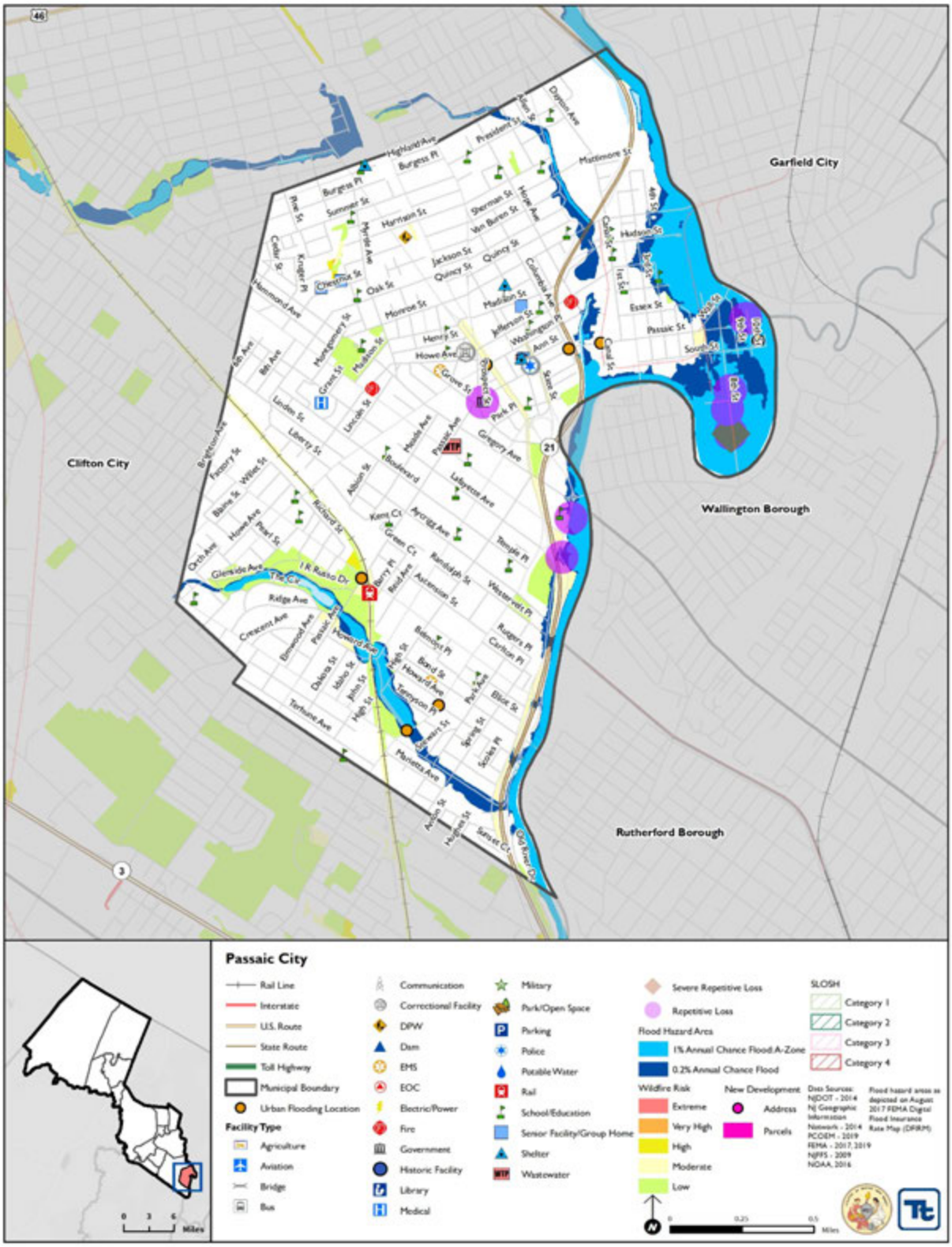
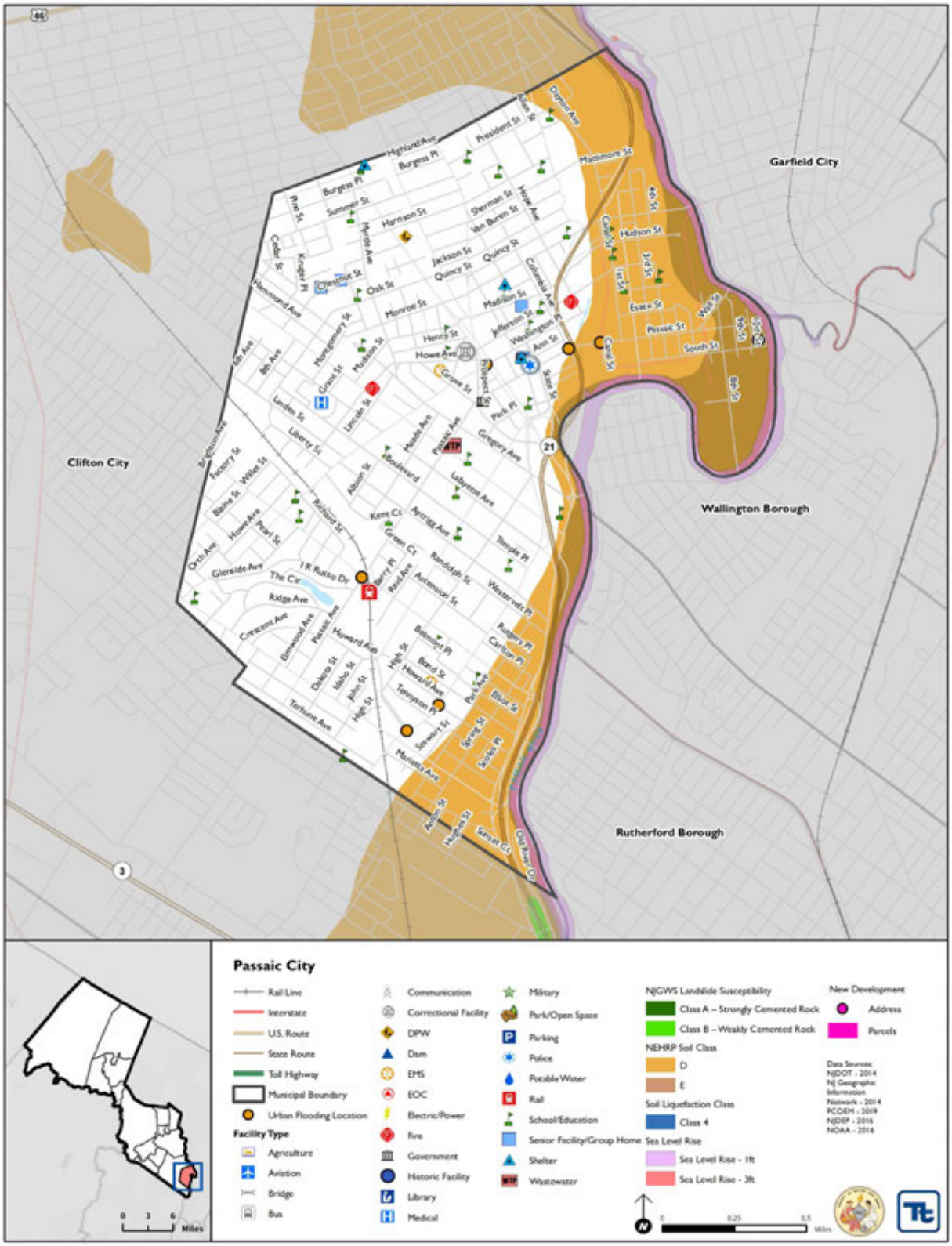


Figure 9.8-2. City of Passaic Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Pennington Avenue culvert		
Project Number:	2020-Passaic-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Flood		
Description of the Problem:	Benson Court, under the Pennington Avenue overpass floods during storm events. The culvert needs to be replaced		
Action or Project Intended for Implementation			
Description of the Solution:	The City will conduct an assessment to determine the proper sized culvert needed at and replace the Pennington Avenue culvert.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by assessment	**Estimated Benefits (losses avoided):**	Reduction of flooding on Benson Court
Useful Life:	30 years	**Goals Met:**	1, 2
Estimated Cost:	TBD by assessment, part of overall $5 million McDonalds Brook Flood Control project	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	HIgh	**Desired Timeframe for Implementation:**	Within 1 year
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	County funding source
Responsible Organization:	County, supported by City	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Stormwater Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Remove culvert and overpass	$100,000	Not a viable option. Roadways need to remain in place.
	Relocated Benson Court	Millions of dollars	Cost of buyouts of properties results in the project not being cost effective

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Pennington Avenue culvert	
Project Number:	2020-Passaic-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will reduce risk to life from flooding and maintain emergency vehicle access.
Property Protection	1	Project will reduce damages from flooding
Cost-Effectiveness	1	
Technical	1	A study of the flooding problem has taken place.
Political	1	
Legal	0	The County has jurisdiction on the project but the City will be providing support.
Fiscal	1	The project has funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Flood
Timeline	1	Within 2 years
Agency Champion	1	Passaic County
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Passaic and Van Houten underpass flooding		
Project Number:	2020-Passaic-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Flood		
Description of the Problem:	Underpass flooding of up to 6 feet results in closures of roadway, damaged cars, and emergency response. This flooding occurs during heavy rain events. The flooding abates quickly, provided that stormwater grates have been kept clear of debris. This suggests that the stormwater system servicing the area is undersized.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will conduct a feasibility assessment to determine the cause of flooding and appropriate mitigation actions. The City will complete the appropriate identified actions once identified. In addition, the City will increase the frequency of stormwater system cleaning to prevent clogs from debris		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	Stormwater improvement design to determined by feasibility assessment	**Estimated Benefits (losses avoided):**	Reduction in frequency/ intensity of flooding
Useful Life:	30 years	**Goals Met:**	1, 2
Estimated Cost:	TBD by feasibility assessment	**Mitigation Action Type:**	Structure and Infrastructure Project, Natural Systems Protections
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	City budget, FMA, PDM, BRIC
Responsible Organization:	County, supported by City	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Stormwater Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Close roadway during heavy rain events	$0	Not a viable option. Staffing issues for closure, continued flooding.
	Close roadway permanently	$500,000	Not a viable option. Roadway needs to remain open and in place.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Passaic and Van Houten underpass flooding	
Project Number:	2020-Passaic-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will reduce risk to life from flooding and maintain emergency vehicle access to the area.
Property Protection	1	Project will reduce damages from flooding, specifically to cars that are often damaged.
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support for the project.
Legal	0	The City has legal jurisdiction to implement the project.
Fiscal	0	The project requires funding support.
Environmental	1	
Social	1	Reduces social impacts of flooding that currently occur.
Administrative	1	
Multi-Hazard	1	Severe Storm, Flood
Timeline	0	Within 5 years
Agency Champion	1	City Engineering
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

9.9 CITY OF PATERSON

This section presents the jurisdictional annex for the City of Paterson. The annex includes a general overview of the City of Paterson; an assessment of the City of Paterson's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.9.1 Hazard Mitigation Planning Team

The following individuals are the City of Paterson's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.9-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Chief Gabriel Aboyoun, OEM Coordinator Address: 111 Broadway Paterson, NJ 07505 Phone Number: 973-321-1410 Email: GAboyoun@patersonnj.gov	Name / Title: Fred Margron, City Engineer Address: 111 Broadway 4th floor, Paterson, NJ 07505 Phone Number: 973-321-1320 Email: fmargron@patersonnj.gov
NFIP Floodplain Administrator	
Name / Title: Jerry Lobozzo, Construction Official Address: 111 Broadway 1st floor, Paterson, NJ 07505 Phone Number: 973-321-1232 x1233 Email: jlobozzo@patersonnj.gov	

9.9.2 Jurisdiction Profile

Paterson, also known as the 'Silk City,' became an incorporated city in 1851. It's location along the Passaic River and near the Great Falls provided many industries the opportunity to harness a source of energy to power their factories. These industries flourished and with their growth, came the beginnings of the Industrial Revolution in the United States (City of Paterson 2014).

Paterson is governed by the Mayor/Council form of government under the Faulker Act (City of Paterson 2014). According to the U.S. Census Bureau, the City has a total land area of 8.074 square miles, of which 8.428 square miles is land and 0.276 square miles is water.

According to the U.S. Census, the 2010 population for the City of Paterson was 146,199. The estimated 2017 population was 147,890, a 1.2 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 7.8 percent of the population is 5 years of age or younger and 11 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.9.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.9-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.9-1 and 9.9-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.9-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	0	30	36	31	37
Multi-Family	0	0	1	1	7
Other (commercial, mixed-use, etc.)	0	2	3	4	10
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
None Identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None identified other than 5th Ave redevelopment					

** Only location-specific hazard zones or vulnerabilities identified.*

9.9.4 Capability Assessment

The City of Paterson performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the City of Paterson.

Table 9.9-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local/State	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Community Improvements enforces the Building Code.*					
Zoning Code	Yes	Local	Yes	No	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
master plan. Chapter 483 of the municipal code (April 2016) of the Township code. The Planning Department enforces the Zoning Code. The purpose of the Chapter are as follows: *A. To plan and guide the appropriate use or development of all land in a manner that will promote the public health, safety, morals and general welfare by means including the following:* *1. By regulating the location of buildings and establishing standards of development; establishing setback lines of buildings designed for residential, commercial, industrial, office or other uses and by fixing reasonable standards to which buildings or structures shall conform.* *2. By prohibiting incompatible uses; and prohibiting uses, buildings or structures that are incompatible with the character of development of the permitted uses within specified zoning districts and surrounding areas.* *3. By regulating alterations of existing buildings; and preventing such additions to and alterations or remodeling of existing buildings or structures as would not comply with the restrictions and limitations imposed hereunder.* *4. By conserving the value of land and buildings throughout the City.* *B. To secure safety from fire, flood, panic and other natural and man-made disasters.* *C. To provide adequate light, air, and open space.* *D. To ensure that the development of the municipality does not conflict with the development and general welfare of neighboring municipalities, the county and state as a whole.* *E. To promote the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions and the preservation of the environment.* *F. To encourage the appropriate and efficient expenditure of public funds by the coordination of public development and land use policies.* *G. To provide sufficient space in appropriate locations for a variety of uses and open space, both public and private, according to their respective environmental requirements.* *H. To encourage the location and design of transportation routes that will promote the free flow of traffic while' discouraging locations of such facilities and routes that result in congestion or blight.* *I. To promote a desirable visual environment through creative development techniques and good civic design and arrangements.* *J. To promote the conservation of open space and valuable natural resources and to prevent the degradation of the environment through improper use of land.* *K. To encourage planned development that incorporates the best features of design and relates the type, design and layout of various types of development to particular sites.* *L. To encourage coordination of the various public and private procedures and activities shaping land development, with a view to lessening the cost of such development and to the more efficient use of land.* *M. To control flooding, soil erosion and sedimentation precipitated by development and caused by water runoff, soil disturbances, destruction or removal of ground cover or plant life, grading or filling.* *N. To provide, within the community's resources, for the future housing needs of the citizens of the City of Paterson.* *O. To encourage senior citizen community housing construction.* *P. To promote utilization of renewable energy sources.* *Q. To promote the maximum practicable recovery and recycling of recyclable materials from municipal solid waste through the use of planning practices designed to incorporate the State Recycling Plan goals and to compliment municipal recycling programs.* *The Ordinance includes Flood Control Review, Soil Erosion Control Review, and Historic Preservation Review.*					
Subdivisions	Yes	Local	Yes	No	-
Comment: *Chapter 297 of the Township code. Planning and Zoning enforce the Subdivision Code. State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 433 of the municipal code; DPW enforces. The Stormwater Control Ordinance establishes minimum stormwater management requirements and controls for major development.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision. Ordinance 98-011.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Growth Management	No	Local	Yes	-	-
Comment: *State mandated at local level*					
Shoreline Development	No	-	No	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	No	-
Comment: *MLUL NJ 40:55d. Enforced by Planning and Zoning.*					
Environmental Protection	Yes	State and Local	Yes		
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Air Pollution Control Code (Chapter 105), Sewer, etc.*					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
Comment*: Chapter 219 of the municipal code, enforced by the Floodplain Manager. It is the purpose of the Flood Damage Prevention Ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:* *A. To protect human life and health.* *B. To minimize expenditure of public money for costly flood control projects.* *C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.* *D. To minimize prolonged business interruptions.* *E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard.* *F. To help maintain a stable tax base by providing for the secondary use and development of areas of special flood hazard so as to minimize future flood blight areas.* *G. To insure that potential buyers are notified that property is in an area of special flood hazard.*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local/State	Yes	No	-
Comment: *3/24/14; MLUL NJ 40:55d. Administered by Planning and Zoning.*					
Capital Improvement Plan	Yes	Local	Allowed	Yes	-
Comment: *2015. Administered by DPW.*					
Disaster Debris Management Plan	Yes	Administration	No	Yes	-
Comment: Has been submitted to NJ DEP for approval					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local and State	Yes	No	-
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).*					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes	-
Comment: *Stormwater Pollution Prevention Plan-May 2005. The Stormwater Pollution Prevention Plan identifies stormwater programs, state basic requirements, local ordinances and enforcement, and the local stormwater management processes.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local/State	No	-	-
Comment: MLUL NJ 40:55d. Planning/Zoning etc.					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	Yes	Local	No	No	-
Comment: *Forestry Management Plan*					
Transportation Plan	Yes	Local/State	No	No	-
Comment: *3/24/14; MLUL NJ 40:55d. planning zoning etc.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	Yes	-	No	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. The city's EOP was updated on March 24, 2014.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment: *Have gone over during LEPC annual meetings*					
Post-Disaster Recovery Plan	No	-	-	-	-
Comment: *Included in EOP - 2/26/2013*					
Continuity of Operations Plan	Yes	Local	Yes	-	-
Comment: *Included in the CEMP*					
Public Health Plan	Yes	Local	Yes	No	-
Comment: *Public Health Plan*					
Other	No	-	-	-	-
Comment:					

Table 9.9-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Planning Board and permitting programs
Does your jurisdiction have the ability to track permits by hazard area?	Yes, City-based GIS system
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, vacant property layer

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the City of Paterson.

Table 9.9-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Economic Development / Planning and Zoning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Administration
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	Administration

Staff/Personnel Resource	Available?	Department/Agency/Position
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, website, social media, Everbridge
Maintenance program to reduce risk	Yes	DPW
Mutual aid agreements	Yes	Paterson Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Economic Development / Planning and Zoning Board
Engineers or professionals trained in building or infrastructure construction practices	Yes	City Engineer
Planners or engineers with an understanding of natural hazards	Yes	Economic Development / Planning and Zoning Board
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	Yes	Planning, Zoning and Engineering
Surveyor	No	-
Stormwater engineer	Yes	City Engineering Division
Personnel skilled or trained in GIS applications	Yes	City Engineer
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	No	-
Grant writers	Yes	City has retained a grant writer
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the City of Paterson.

Table 9.9-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the City of Paterson.

Table 9.9-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Public Information Officer
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, mayor uses social media for various announcements.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes. Fire department has a public education department. Board of Health. Police Department.
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; Reverse 911, website, social media, Everbridge.

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the City of Paterson.

Table 9.9-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	2	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	none	7/6/2010

ADAPTIVE CAPACITY

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.9-9. Adaptive Capacity of Climate Change

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	The City is aware of resources.
Is the administrative supportive of integrating climate change in policies or actions?	The City would be open to integration.

Criterion	Response
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	The City is not currently integrating climate change in current policies, plans, or actions.

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Medium
Disease Outbreak	High
Drought	Medium
Earthquake	Low
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	High
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	High

Notes:
High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;
Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.9-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Community Improvement, Engineering, Planning, DPW
Who is your floodplain administrator? (name, department/position)	Jerry Lobozzo, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	Unknown
What is the date that your flood damage prevention ordinance was last amended?	January 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets minimum requirements
When was the most recent Community Assistance Visit or Community Assistance Contact?	Unknown
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes, training would be beneficial
˜ If so, what type of assistance/training is needed?	Any floodplain training

Criterion	Response
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Flood insurance policies: 864 Insurance in force: $147,350,600 Premium in force: $1,299,120
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 1,233 Claims still open or closed without payment: 221 Total payments for losses: $36,771,632
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of 03/31/2019*

9.9.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the City of Paterson made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Division of Planning and Zoning:** The role of the Division of Planning and Zoning is to guide growth and development through informed and thoughtful regulation and analysis of land use within the City of Paterson utilizing the City's Master Plan. The division is charged with maintaining continuity between the Zoning Ordinances and other land use elements. The Division of Planning and Zoning is tasked with the following responsibilities including, but not limited to:
  - Administering and providing staff support to the Planning Board (PB) and the Zoning Board of Adjustment (ZB)
  - Processing, reviewing and commenting on on development applications to the PB and ZB.
  - Evaluating Master Plan and Land Development ordinances.
  - Soliciting community input for development plans.
  - Providing information to the public and to regional planning agencies.
  - Enforcing decisions made by the Planning Board and Zoning Board of Adjustment.
  - Reviewing construction plans, permit applications and certificate of occupancy applications for zoning compliance.
- **Division of Redevelopment:** The Division of Redevelopment has been reactivated in response to the City of Paterson's Memorandum of Understanding with the National Park Service for the creation of Great Falls National Historic Park. The focus of the division is urban renewal and redevelopment.
- **Historic Preservation Commission:** The Commission is charged with evaluating, promoting, and preserving the City's historic environment. This is accomplished through a variety of programs, such as historic landmark designation, seasonal educational tours, events, and the annual Historic Preservation

Awards. The Commission is empowered with a specific role in municipal land use and building permits with respect to applications for proposed alterations to the exterior of structures within any municipally-designated historic district, or on any municipally-designated individual landmark or site. To carry this out, the Commission advises the Division of Planning and Zoning, the Planning Board and Zoning Board of Adjustment on zoning applications for development, and also reviews all building permit applications presented through the Division of Community Improvements.

- **Public Safety Department:** The mission of the Public Safety Department is to protect and serve the residents of Paterson through the work of four divisions: Police, Fire, Office of Emergency Management, and Animal Control. The Public Safety Department includes outreach information on hazards on the Department's page on the municipal website.
- **Environmental Commission:** The Environmental Commission was established for the protection, development or use of natural resources, including air and water resources, located within the territorial limits of the City of Paterson. The Commission conducts research into the use and possible use of the open land areas of the municipality and coordinates the activities of unofficial bodies organized for similar purposes, and advertises, prepares, paints, and distributes books, maps, charts, plans and pamphlets which in its judgment it deems necessary for its purposes. It keeps an index of all open areas, publicly or privately owned, including open marshland, swamps and other wetlands, in order to obtain information on the proper use of such areas and may from time to time recommend to the Planning Board, subject to the approval of the Municipal Council by resolution, plans and programs for inclusion in the Master Plan and the development and use of such areas.
- **Central Passaic River Commission:** The Commission is a multijurisdictional organization that carries out the following duties:
  - Collect, study and analyze data on flooding, past floods and the causes of floods in the area;
  - Make such data and studies available to the participating members, to the Department of Environmental Protection, Division of Water Supply, the Army Corps of Engineers, local and county planning boards and officials concerned with subdivisions and development of properties within the floodway and drainage area;
  - Keep itself informed as to the available state and federal funds and grants and the procedures for applying therefor and shall make such information available to participating members;
  - Coordinate the activities of the participating members relating to flooding, flood prevention, brook cleaning and the like;
  - Encourage the acquisition of lands within the floodway and low-lying areas by appropriate county park commissions, counties or participating municipalities and all federal and state agencies that have jurisdiction in matters concerning the floodway and low-lying area;
  - Publicize methods of flood control and flood prevention;
  - Encourage its participating members to support other programs designed or intended to alleviate flooding;
  - Lobby federal and state legislators and federal and state agencies to promote legislation favorable to the Central Passaic River Basin and also to make available increased funding for flood control measures in the Central Passaic River Basin;
  - Perform such other acts and fulfill such other functions as may be permitted by law and as determined by members, subject to the limitations in this section and subject to limitations set forth in N.J.S.A. 40:14-16.
- **Green Team:** The City of Patterson's Green Team's mission, goals and objectives are as follows:
  - To facilitate the successful completion of the requirements for certification of Sustainable Jersey (www.sustainablejersey.com).

- Educate and encourage all City employees, residents and businesses to participate in green initiatives.
- Collaborate with public and private green committees to ensure the replication of best practices and to ensure a coordinated effort within the City of Paterson and with neighboring communities.

Opportunities for Future Integration

As this HMP update is implemented, the City of Paterson will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The City will use adaptation guidance to update plans and ordinances as appropriate.

9.9.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The City of Paterson's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.9-11 provides details regarding municipal-specific loss and damages the City experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.9-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6-7, 2018	Severe Winter Storm and Snowstorm (DR-4368)	Yes	A winter storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. Passaic reported 11 to 20 inches of snowfall.	The city incurred costs for snow removal, implemented emergency protection measures, and tree debris cleanup.
August 11, 2018	Flash Flood	N/A	A stalled stationary boundary within a very moist airmass provided a focusing mechanism for several rounds of heavy rain that resulted in widespread flash flooding across northeast New Jersey.	I-80 flooded in both directions at Exit 59 (Market Street) in Paterson.
January 1, 2019	Cold snap and snowstorm	N/A	Extreme cold event	Extreme cold resulted in a Code Blue declaration, resulting in

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
				the city opening warming shelters. No FEMA reimbursement for City. Did allow residents assistance.
August 7, 2019	Flash Flood	N/A	Showers and thunderstorms developed across northeast New Jersey ahead of a cold front during the afternoon of August 7th. These storms developed in an environment with precipitable water values close to 2 inches. Multiple rounds of showers and storms exacerbated the flash flood threat, with many locations receiving 1-3 inches of rain, much of which fell in only a few hours.	Car damages occurred from flash flooding.

9.9.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following summarizes the hazards of greatest concern and risk to the City of Paterson.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.9-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	147,890	100-year MRP Hurricane:	23,609	100-year MRP Hurricane:	$8,794,608	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	7,325	NEHRP D&E:	1,935	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	369	Liquefaction Class 4:	202	500-year MRP building damages/loss:	$2,967,949	
						2,500-year MRP building damages/loss:	$48,359,165	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	15,691	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	42,888			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	4,795	1% annual chance	1,220	1% annual chance	$123,320,761	High
		0.2% annual chance	9,003	0.2% annual chance	3,255			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	38	Class A:	55	Class A:	$19,000,533	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	16	Number of buildings the hazard area:	10	Replacement cost value of buildings located in the hazard area:	$95,981,246	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the City of Paterson.

- Number of repetitive loss (RL) properties: 155
- Number of severe repetitive loss (SRL) properties: 40
- Number of RL/SRL properties that have been mitigated: 22 through CDBG-DR

Source: FEMA March 2019
Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.9-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Don Bosco Technology Academy	School		X	
Gifted & Talented Academy @ School 28	School	X	X	2020-Paterson-014
Number 28 E.S.	School		X	
Number 4 E.S.	School	X	X	2020-Paterson-014, B.O.E. raised furnaces after Irene.
Paterson FD Headquarters, OEM: 300 McBride Ave*	EOC, Fire		X	
Paterson Charter School For Sci&Tech K-1	School		X	
Paterson FD- Hillcrest Firehouse*	Fire		X	
Paterson Great Falls Hydro Electrical Plant	Electric Power	X	X	2020-Paterson-015
Prospect Park Sewage Collection Pit*	Wastewater Pump		X	

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- The City needs additional warming shelters. As County seat, shelters get filled up very quickly.
- Flooding occurs at St. Joseph's Hospital.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the City of Paterson that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the City of Paterson has significant exposure. Refer to Figures 9.9-1 and 9.9-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; and community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the City of Paterson. The City of Paterson has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the City indicated the following:

- The City changed the hazard ranking for coastal storm from high to medium.
- The City changed the hazard ranking for dam failure from low to medium due to the potential impacts of Woodland Park dam.
- The City agreed with the remainder of the calculated hazard rankings.

Table 9.9-14. City of Paterson Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Medium	Medium	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Medium	Medium	Medium	Medium	Medium	Low

9.9.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.9-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Paterson-1: Replacement of manually operated trash screen on Molly Ann Brook with mechanical screen.	Paterson DPW	No Progress	X	2020-Paterson-001
Paterson-2: Creation of a Public Information Officer that will inform and educate citizens, property owners about hazards and mitigation with the potential of initiating national programs	Municipal Administration	In progress. Position established but not working on hazard mitigation yet.	X	2020-Paterson-002
Paterson-3: Acquisition of logistics vehicle for transportation of critical resources	Fire Department	No Progress On hold due to pandemic	X	2020-Paterson-003
Paterson-4: Have designated floodplain administrator become a certified flood plain manager (CFM).	Economic Development	No Progress	X	2020-Paterson-004
Paterson-5: Support the mitigation of hazard vulnerable structures including the acquisition of Repetitive and Severe Repetitive Loss properties.	Community Development	In progress	X	2020-Paterson-005
Paterson-6: Support and participate in county-led initiatives intended to build local and regional mitigation and risk-reduction capabilities	Municipal Engineering	In progress		
Paterson-7: Ensure continuity of services and operations: 1.Purchase portable generators for critical infrastructure 2. Obtain backup power for shelter at Riverside Vets Community Center	Facilities	In progress; have some portable generators.	X	2020-Paterson-006
Paterson-8: Currently the Public Safety Answering Point is located in the floodplain. Design/construct a new Emergency Communications System outside of designated Flood Plain	Fire Department	Acquired new structure, plans being finalized.	X	2020-Paterson-007
Paterson-9: Currently police headquarters is located in the floodplain and has experienced losses. Relocate/construct a new Municipal/City Complex.	City of Paterson	In progress; searching for a new location.	X	2020-Paterson-008
Paterson-10: The fire house on Temple Street is located in the floodplain. Construct a new firehouse outside of the floodplain.	Fire Department	No Progress	X	2020-Paterson-009
Paterson-11: Currently the Hillcrest Firehouse on Union Ave is located in the floodplain, Construct a new fire house outside of the hazard area.	Fire Department	No Progress	X	2020-Paterson-010
Paterson-12: Purchase and install a mobile communication system for first response vehicles that would greatly enhance the response to large scale emergencies	Fire Department	No Progress	X	2020-Paterson-011
Paterson-13: The purchase of a portable emergency broadcast system that can be placed in a mobile	Fire Department	In progress	X	2020-Paterson-012

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
command center or at any scene that can alert citizens as well as motorist of emergency alerts and actions that can include evacuations and traffic diversions that need to be adhered to during an emergency. Since this is a portable device power outages will not delay the emergency transmissions.				
Paterson-14: Green Infrastructure Strategic Plan seeks to develop place-based stormwater management and flood control strategies and identify implementable climate adaptation action steps. To develop a framework for green infrastructure, including cost-effective, long-term solutions to update the aging system and integrate source controls into the design and construction of public improvement, private development, open space and right-of-way projects.	Engineering	In progress; CSO Plan has a green infrastructure element.	X	2020-Paterson-013

In addition to the above progress, the City of Paterson identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The City of Paterson has completed major sewer cleaning. The city has removed boulders from pipes, etc. to increase conveyance. The city has spent roughly $2M over the last 5 years.
- The city has purchased Everbridge and it is live now for emergency notification.

Proposed Hazard Mitigation Initiatives for the Plan Update

The City of Paterson participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The City of Paterson in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.9-16 summarizes the comprehensive range of specific mitigation initiatives the City of Paterson would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation

action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.9-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Paterson-001	Molly Ann Brook mechanical screen	Mechanical operated trash screen is in need of replacement.	Replacement of manually operated trash screen on Molly Ann Brook with mechanical screen.	Existing	Flood, Severe Storm	2	Paterson DPW	Municipal budget	Molly Ann Brook kept clear	$20,000	Within 3 years	High	SIP	SP
2020-Paterson-002	Train Public Information Officer in hazard mitigation concepts	The City's public information officer lacks hazard mitigation training.	Train Public Information Officer to inform and educate citizens, property owners about hazards and mitigation with the potential of initiating national programs.	N/A	All hazards	5	Public Information Officer, Administration	Municipal budget	Increased public knowledge	Staff time	Within 1 year	High	EAP	PI
2020-Paterson-003	Logistics vehicle	The City lacks a logistics vehicle.	Purchase logistics vehicle for transportation of critical resources	N/A	All hazards	5, 6	Fire Department, Administration	Emergency Management Grant	Increased emergency response	$75,000	Within 1 year	High	LPR	ES
2020-Paterson-004	Certified Floodplain Manager	The floodplain manager needs additional training.	The floodplain manager will undergo training to become a certified floodplain manager.	N/A	Flood	5	Economic Development, Administration	Municipal budget, DEP funded trainings	Increase capabilities of floodplain manager	Staff time	Within 1 year	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Paterson-005	Mitigation of hazard vulnerable structures	The City flood repetitive loss properties and severe repetitive loss properties.	Support the mitigation of hazard vulnerable structures including the acquisition of Repetitive and Severe Repetitive Loss properties. Conduct outreach to develop a list of property owners that want to mitigate. Set up a multi-year plan to prioritize and apply for FEMA grant funding.	Existing	Flood, Severe Storm	1, 2	Floodplain Administrator	BRIC, HMGP, FMA, PDM	Removes properties from the floodplain, reduces flood exposure	$3 million	Within 5 years	High	SIP	PP
2020-Paterson-006	Ensure continuity of operations	Critical facilities require backup power to ensure continuity of operations	Purchase portable generators for critical infrastructure Obtain backup power for shelter at Riverside Vets Community Center	Existing	All hazards	6	Facilities	HMGP, municipal budget	Critical services protected	$100,000	Within 5 years.	High	SIP	PP, ES
2020-Paterson-007	Relocate Emergency Communications System outside of designated Flood Plain	Currently the Public Safety Answering Point is located in the floodplain.	Design/construct a new Emergency Communications System outside of designated Flood Plain. A	Existing	Flood	2, 6	Fire Department	Municipal budget, CDBG, Assistance to Firefighte	Critical facility removed from	$200,000	Within 5 years	High	SIP	PP, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			new structure has been identified and plans are being finalized.					r Grant Program	hazard zone.					
2020-Paterson-008	Relocate police headquarters out of floodplain	Currently police headquarters is flood prone and has experienced losses.	Relocate/construct a new Municipal/City Complex outside of flood hazard area.	Existing	Flood	1, 2, 6	City of Paterson Police Department	Municipal budget, CHIPS, HMGP	Critical facility removed from hazard zone.	$750,000	Within 5 years	High	SIP	PP, ES
2020-Paterson-009	Relocate Temple Street fire house out of floodplain	The fire house on Temple Street is flood prone.	Construct a new fire house outside of the flood hazard area.	Existing	Flood	1, 2, 6	Fire Department	Municipal budget, CHIPS, Assistance to Firefighter Grant Program	Critical facility removed from hazard zone.	$750,000	Within 5 years	High	SIP	PP, ES
2020-Paterson-010	Relocate Hillcrest fire house out of floodplain	The Hillcrest fire house is flood prone..	Construct a new fire house outside of the flood hazard area.	Existing	Flood	1, 2, 6	Fire Department	Municipal budget, CHIPS, Assistance to Firefighter Grant Program	Critical facility removed from hazard zone.	$750,000	Within 5 years	High	SIP	PP, ES
2020-Paterson-011	Mobile communication system for first response vehicles		Purchase and install a mobile communication system for first response vehicles that would greatly	N/A	All hazards	6	Fire Department, Administration	Assistance to Firefighter Grant Program, municipal budget	Mobile communications for emerg	$10,000	Within 1 year	High	LPR	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			enhance the response to large scale emergencies						ency response preserved.					
2020-Paterson-012	Portable emergency broadcast system	Power outages can interrupt the emergency broadcast system.	Purchase a portable emergency broadcast system that can be placed in a mobile command center or at any scene that can alert citizens as well as motorist of emergency alerts and actions that can include evacuations and traffic diversions that need to be adhered to during an emergency.	N/A	All hazards	6	Fire Department	Assistance to Firefighter Grant Program, municipal budget	Power outages will not delay the emergency transmissions.	$10,000	Within 1 year	High	LPR	ES
2020-Paterson-013	Develop place-based stormwater management and flood control strategies and identify implementable climate adaptation action steps	The city needs to implement stormwater management measures and climate adaptation actions.	Develop a framework for green infrastructure, including cost-effective, long-term solutions to update the aging system and integrate source controls into the design and construction of	New and Existing	Flood, All hazards	5	Engineering	Municipal budget	Increased efficiency of storm water system	TBD by solutions identified	5 years	High	LPR	PR, SP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			public improvement, private development, open space and right-of-way projects.											
2020-Paterson-014	Conduct outreach to schools located in the 100-year floodplain.	Gifted & Talented Academy @ School 28 and Number 4 E.S. are located in the 100-year floodplain.	Discuss flood exposure with facility managers. Discuss possible mitigation measures that could be taken.	Existing	Flood	2	FPA, facility managers	City budget	Facility managers made aware of flood risk	Staff time	6 months	High	EAP	PI
2020-Paterson-015	Conduct outreach to Paterson Great Falls Hydro Electrical Plant	Paterson Great Falls Hydro Electrical Plant is located in the 100-year floodplain.	Discuss flood exposure with facility manager. Discuss possible mitigation measures that could be taken.	Existing	Flood	2	FPA, facility manager	City budget	Facility manager made aware of flood risk	Staff time	6 months	High	EAP	PI
2020-Paterson-016	Warming shelters.	The City needs additional warming shelters. As County seat, shelters get filled up very quickly.	The City will develop additional warming shelters	Existing	Extreme Temperature	1	Office of Emergency Management	City budget	Increased warming shelter capacity	$50,000	2 years	High	SIP	PP, ES
2020-Paterson-017	Flood protection for St. Joseph's Hospital.	Flooding occurs at St. Joseph's Hospital.	The City will conduct outreach to St. Joseph's Hospital and discuss potential	Existing	Flood, Severe Storm	1, 2	FPA, Facility manager	City budget	Increase flood protection of critica	Staff time	Within 6 mon	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			mitigation actions						l facility		ths			
2020-Paterson-018	Establish fully staffed and equipped Hazardous Materials Team	The City needs a well-equipped Hazardous Materials Team to respond to hazardous material situations	The City will staff and equip a Hazardous Materials Team	New and Existing	All hazards	1, 2, 3, 4	OEM	City budget	Increased capacity	TBD	Within 3 years	High	LPR	ES
2020-Paterson-019	Implement Long Term Control Plan	The City is adopting a Long-Term Control Plan to separate the combined sewerage overflow system in fall 2020 to reduce release of sewage and reduce flooding.	The City will implement the selected elements of the Long-Term Control Plan to separate the combined sewerage overflow system.	Existing	Flood, Severe Storm, Hazardous Substances	2, 4	Engineering	City budget, HMGP, State and Federal sources	Separation of sewer and	$300,000 per acre of area separated; $390,000 per acre of impervious surface treated	Within 5 years	High	SIP	SP

Notes:

Acronyms and Abbreviations:
CAV Community Assistance Visit
CRS Community Rating System
DPW Department of Public Works
FEMA Federal Emergency Management Agency

Potential FEMA HMA Funding Sources:
FMA Flood Mitigation Assistance Grant Program
HMGP Hazard Mitigation Grant Program
PDM Pre-Disaster Mitigation Grant Program

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.9-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Paterson-001	Molly Ann Brook mechanical screen	0	1	1	1	1	1	0	1	1	1	1	0	1	1	11	High
2020-Paterson-002	Train Public Information Officer in hazard mitigation concepts	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Paterson-003	Logistics vehicle	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Paterson-004	Certified Floodplain Manager	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Paterson-005	Mitigation of hazard vulnerable structures	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Paterson-006	Ensure continuity of operations	1	1	0	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-Paterson-007	Relocate Emergency Communications System outside of designated Flood Plain	1	1	1	1	1	1	0	1	0	1	0	0	1	1	10	High
2020-Paterson-008	Relocate police headquarters out of floodplain	1	1	1	1	1	1	0	1	0	1	0	0	1	1	10	High
2020-Paterson-009	Relocate Temple Street fire house out of floodplain	1	1	1	1	1	1	0	1	0	1	0	0	1	1	10	High
2020-Paterson-010	Relocate Hillcrest fire house out of floodplain	1	1	1	1	1	1	0	1	0	1	0	0	1	1	10	High
2020-Paterson-011	Mobile communication system for first response vehicles	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Paterson-012	Portable emergency broadcast system	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Paterson-013	Develop place-based stormwater management and flood control strategies and identify implementable climate adaptation action steps	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2020-Paterson-014	Conduct outreach to schools located in the 100-year floodplain.	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Paterson-015	Conduct outreach to Paterson Great Falls Hydro Electrical Plant	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Paterson-016	Warming shelters.	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Paterson-017	Flood protection for St. Joseph's Hospital.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Paterson-018	Establish fully staffed and equipped Hazardous Materials Team	1	1	0	1	1	1	0	1	1	1	1	0	1	1	11	High
2020-Paterson-019	Implement Long-Term Control Plan	0	1	0	1	1	1	0	1	1	1	1	0	1	1	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.9-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Dam Failure	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Disease Outbreak	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Drought	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Earthquake	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Extreme Temperature	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-016	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012, 2020-Paterson-016	2020-Paterson-013		

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Flood	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-007, 2020-Paterson-008, 2020-Paterson-009, 2020-Paterson-010	2020-Paterson-002, 2020-Paterson-014, 2020-Paterson-015, 2020-Paterson-017, 2020-Paterson-017	2020-Paterson-001	2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-007, 2020-Paterson-008, 2020-Paterson-009, 2020-Paterson-010, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-001, 2020-Paterson-013, 2020-Paterson-019		
Geological Hazards	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		
Hazardous Substances	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013, 2020-Paterson-019		
Infestation and Invasive Species								
Severe Weather	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-017	2020-Paterson-002	2020-Paterson-001	2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-001, 2020-Paterson-013, 2020-Paterson-019		
Severe Winter Weather	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Wildfire	2020-Paterson-004, 2020-Paterson-013	2020-Paterson-005, 2020-Paterson-006	2020-Paterson-002		2020-Paterson-005, 2020-Paterson-006, 2020-Paterson-011, 2020-Paterson-012	2020-Paterson-013		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.9.9 Staff and Local Stakeholder Involvement in Annex Development

The City of Paterson followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.9-19. Contributors to the Annex

Entity	Title	Method of Participation
Rhonda E Thompson	OEM Coordinator (former)	Primary POC, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
Chief Fabriel Aboyoun	OEM Coordinator (former)	Primary POC, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
Fred Margron	City Engineer	Reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
Elizabeth Fornier	OEM Deputy Coordinator/Fire Department	Attended the mitigation strategy workshop and worked with NJOEM on their annex.
Cameron Gardener	OEM Deputy Coordinator	Attended the risk assessment meeting in January 2020.
Jerry Lobozzo	Construction Official and NFIP Floodplain Administrator	NFIP Floodplain Administrator, attended meetings, reviewed annex
Andre Sayegh	Mayor/Administrator	Reviewed annex
Michael Deutsch	Land Use Planner	Reviewed annex
Marge Cherone	Fiscal/CFO	Reviewed annex
William Rodriguez	Public Works Director	Reviewed annex
Chief Ibrahim Baycora	Police Official	Reviewed annex

Figure 9.9-1. City of Paterson Hazard Area Extent and Location Map 1

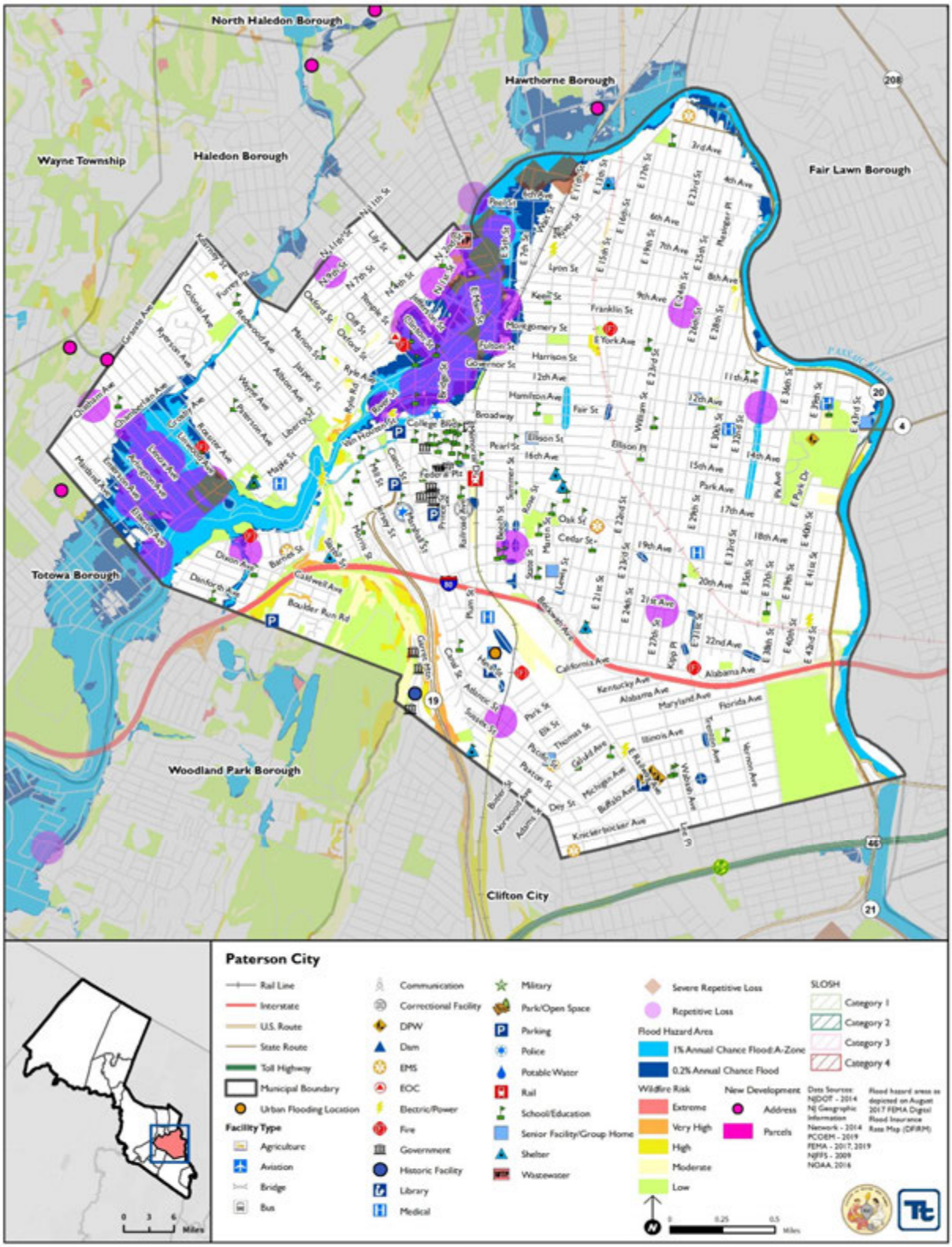
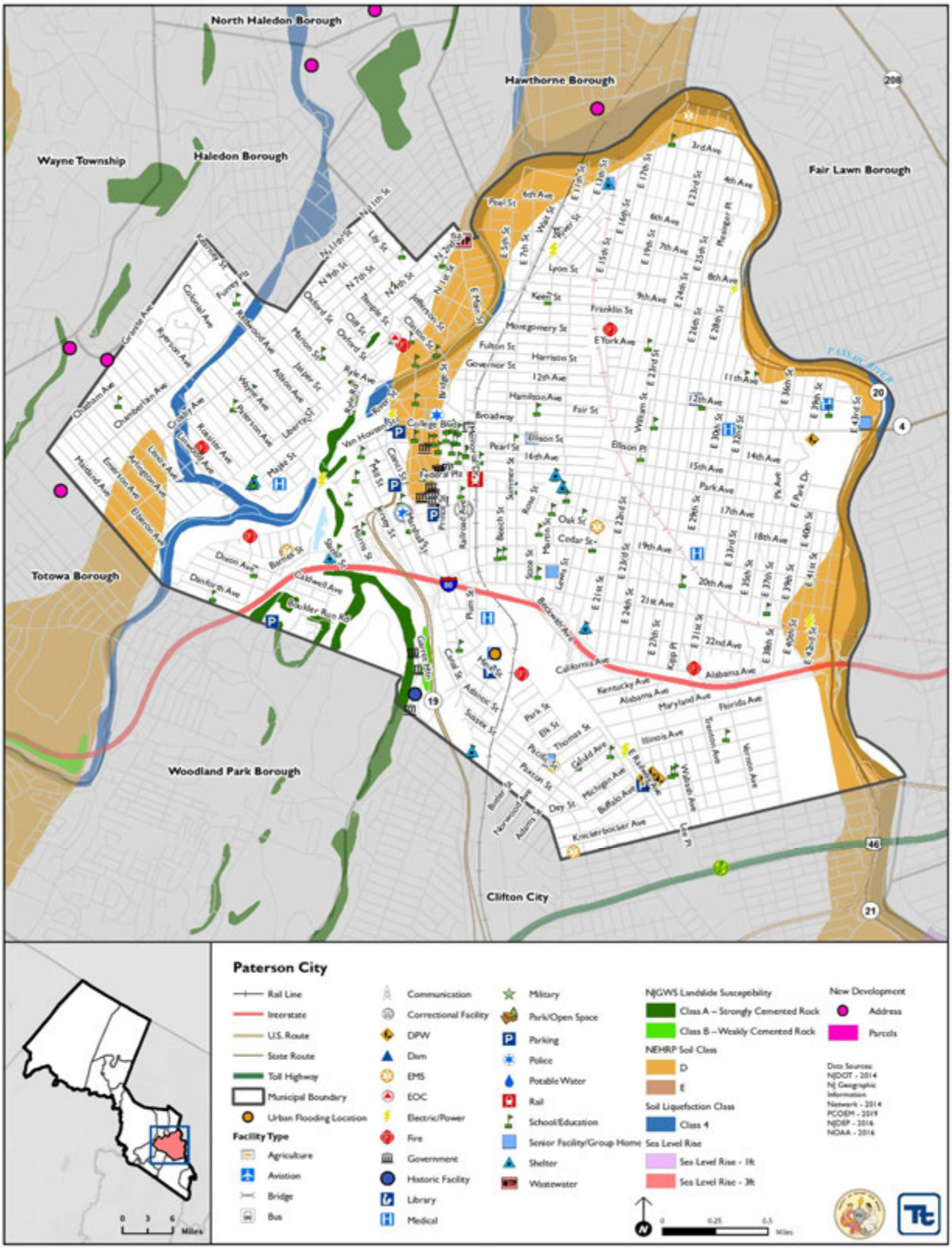


Figure 9.9-2. City of Paterson Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Mitigation of hazard vulnerable structures		
Project Number:	2020-Paterson-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in flood prone areas of the City, near the Passaic River. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 30 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$3Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Mitigation of hazard vulnerable structures	
Project Number:	2020-Paterson-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The City has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from flood prone areas of the City
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Ensure continuity of operations		
Project Number:	2020-Paterson-006		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	Critical facilities require backup power to ensure continuity of operations and the maintenance of critical services. Some critical infrastructure require		
Action or Project Intended for Implementation			
Description of the Solution:	The City will purchase portable generators for critical infrastructure and obtain a permanent backup generator and electrical components for the shelter at Riverside Vets Community Center.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations; provides a shelter for residents
Useful Life:	20 years	**Goals Met:**	1, 2
Estimated Cost:	$60,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Immediately after funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Facilities	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Ensure continuity of operations	
Project Number:	2020-Paterson-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services
Property Protection	1	Project will protect critical facilities and infrastructure
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	1	The City has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	1 year
Agency Champion	1	Facilities
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Relocate Emergency Communications System outside of designated Flood Plain		
Project Number:	2020-Paterson-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Currently the Public Safety Answering Point is located in the floodplain.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will design/construct a new Emergency Communications System outside of designated Flood Plain. A new structure has already been identified for this purpose.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500 year flood level	**Estimated Benefits (losses avoided):**	Critical services protected
Useful Life:	50 years	**Goals Met:**	2, 6
Estimated Cost:	$200,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Municipal budget, CDBG, Assistance to Firefighter Grant Program
Responsible Organization:	Fire Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate facility	$150,000	Access to facility still limited
	Temporary flood wall	$20,000	Requires construction, still results in limited access during flood events.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Relocate Emergency Communications System outside of designated Flood Plain	
Project Number:	2020-Paterson-007	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects critical services
Property Protection	1	Project protects facility from flood damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The City has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Relocate police headquarters out of floodplain		
Project Number:	2020-Paterson-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Currently the Police Headquarters is flood prone and has experienced past flood damages.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will relocate/construct a new Municipal/City Complex outside of flood hazard area.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☒	
Level of Protection:	500 year flood level	**Estimated Benefits (losses avoided):**	Critical services protected
Useful Life:	50 years	**Goals Met:**	2, 6
Estimated Cost:	$750,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Municipal budget, CHIPS, HMGP
Responsible Organization:	City of Passaic Police Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate facility	$150,000	Access to facility still limited
	Temporary flood wall	$20,000	Requires construction, still results in limited access during flood events.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Relocate police headquarters out of floodplain	
Project Number:	2020-Paterson-008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects critical services
Property Protection	1	Project protects facility from flood damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The City has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Relocate Temple Street fire house out of floodplain		
Project Number:	2020-Paterson-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The fire house on Temple Street is flood prone.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will construct a new fire house outside of the flood hazard area.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☒	
Level of Protection:	500 year flood level	**Estimated Benefits (losses avoided):**	Critical services protected
Useful Life:	50 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$750,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Municipal budget, CHIPS, Assistance to Firefighter Grant Program, HMGP
Responsible Organization:	City of Passaic Police Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate facility	$150,000	Access to facility still limited
	Temporary flood wall	$20,000	Requires construction, still results in limited access during flood events.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Relocate Temple Street fire house out of floodplain	
Project Number:	2020-Paterson-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects critical services
Property Protection	1	Project protects facility from flood damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The City has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Relocate Hillcrest Fire House out of floodplain		
Project Number:	2020-Paterson-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The Hillcrest Fire House is flood prone.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will construct a new fire house outside of the flood hazard area.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☒	
Level of Protection:	500 year flood level	**Estimated Benefits (losses avoided):**	Critical services protected
Useful Life:	50 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$750,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Municipal budget, CHIPS, Assistance to Firefighter Grant Program, HMGP
Responsible Organization:	City of Passaic Police Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate facility	$150,000	Access to facility still limited
	Temporary flood wall	$20,000	Requires construction, still results in limited access during flood events.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Relocate Hillcrest Fire House out of floodplain	
Project Number:	2020-Paterson-010	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects critical services
Property Protection	1	Project protects facility from flood damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The City has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.10 BOROUGH OF POMPTON LAKES

This section presents the jurisdictional annex for the Borough of Pompton Lakes. The annex includes a general overview of the Borough of Pompton Lakes; an assessment of the Borough of Pompton Lakes' risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.10.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Pompton Lakes' identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.10-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Albert Evangelista, OEM Coordinator Address: 25 Lenox Avenue, Pompton Lakes, NJ 07442 Phone Number: 973-583-2879 Email: oem@pomptonlakes-nj.gov	Name / Title: Kevin R. Boyle, Administrator Address: 25 Lenox Avenue, Pompton Lakes, NJ 07442 Phone Number: 973-835-0143 (238) Email: administrator@pomptonlakes-nj.gov
NFIP Floodplain Administrator	
Name / Title: Sal Poli, Construction Official Address: 25 Lenox Avenue, Pompton Lakes, NJ 07442 Phone Number: 973-835-0143 Email: construction@pomptonlakes-nj.gov	

9.10.2 Jurisdiction Profile

The area now known as Pompton Lakes was originally purchased in 1695 and settled in 1697. In the early 1700's, the construction of the Pompton Furnace began; the Furnace would become an important supplier for ammunition during the French-Indian War, the Revolutionary War and the War of 1812. During the Industrial Revolution, it would expand and become a large steelworks plant. Incorporated in 1895, the Borough's industrial past would drive its suburban and commercial land use (Borough of Pompton Lakes 2014).

Pompton Lakes is governed by the Borough form of government (Borough of Pompton Lakes 2014). According to the U.S. Census Bureau, the Borough has a total land area of 3.191 square miles, of which 2.913 square miles is land and 0.278 square miles is water. According to the U.S. Census, the 2010 population for the Borough of Pompton Lakes was 11,097.

According to the U.S. Census, the 2010 population for the Borough of Pompton Lakes was 11,097. The estimated 2017 population was 11,205, a 1.0 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.0 percent of the population is 5 years of age or younger and 13.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.10.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.10-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.10-1 and 9.10-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.10-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	1	3	1	1	0
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Lakeside Residences	Residential	52 Units	21 Lakeside Avenue	NEHRP Soil Class D	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*

9.10.4 Capability Assessment

The Borough of Pompton Lakes performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Pompton Lakes.

Table 9.10-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local/State	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Administered by the Building Department.*					
Zoning Code	Yes	Local	Yes	Yes	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Chapter 190 of Borough Code (Zoning and Land Use Regulations) is administered by the Mayor and Council. The chapter was most recently updated in 2019. The purpose of this chapter is to provide rules, regulations and standards to guide land development in the Borough of Pompton Lakes in order to promote the public health, safety and general welfare of the municipality. It shall be administered to ensure the orderly growth and development, the conservation, protection and proper use of land and adequate provision for circulation, utilities and services in accordance with the purposes of the Municipal Land Use Law (N.J.S.A. 40:55D-2). The ordinance includes an article (Article VII) for subdivision and site plan review and Well head protection areas (Article X)*					
Subdivisions	Yes	Local	Yes	Yes	-
Comment: *Chapter 297 of the Borough code. Planning and Zoning enforce the Subdivision Code. State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2. The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Chapter 190 of Borough Code is administered by the Mayor and Council.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 433 of the municipal code; DPW enforces. Ordinance 06-02 and Ordinance 06-09 are administered by DPW.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs, Local	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision. The Building Department is responsible at the local level.*					
Growth Management	No	Local	Yes	-	-
Comment: *State mandated at local level*					
Shoreline Development	No	-	No	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	Yes	-
Comment: *MLUL NJ 40:55d. Site plan review is administered by the Zoning Department and is administered by the Mayor and Council. Site plan review requirements are laid out in Chapter 190 of the municipal code.*					
Environmental Protection	Yes	State and Local	Yes	No	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Environmental Regulations are discussed in Chapter 9 of the municipal code.*					
Flood Damage Prevention	Yes	Local	Yes	No	-
Comment*: The Flood Damage Prevention Ordinance was last update in 2016, Chapter 16 of the municipal code. The Ordinance is administered by the Mayor and Council.*					
Wellhead Protection	Yes	Local	Yes	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Chapter 190 of Borough Code, Article X discusses wellhead protection and is administered by the Mayor and Council.*					
Emergency Management	No	-	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	Yes	Local	-	No	-
Comment: *The Construction code ordinance notes that substantial damages result in higher standards for reconstruction.*					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local/County/State	Yes	No	-
Comment: *Administered by the Planning Board. Pompton Lakes existing Master Plan (http://www.pomptonlakesgov.com/DocumentCenter/View/558/Master-Plan-Draft-12-5-17?bidId=) was adopted in January 2007. The most recent Master Plan Reexamination Report was adopted in 2017. Updated goals related to natural hazards include:* *•Preserve open space to protect critical environmental resources, such as wetlands, floodplains, ridge lines, steep slopes, and stream and river corridors.* *•Protect and preserve water resources and watershed lands for purposes of drinking water supply, flood control and recreation.*					
Capital Improvement Plan	Yes	Local	Allowed	Yes	-
Comment: *Capital improvements are identified in the annual budget which is adopted yearly. The budget includes funding for mitigation and is administered by the Mayor and Council.*					
Disaster Debris Management Plan	Yes	Administration	No	Yes	-
Comment: *Has been submitted to NJ DEP for and is conditionally approved.*					
Floodplain or Watershed Plan	Yes	Local	No	No	-
Comment: *2007, Ordinance 07-12. Administered by the Mayor and Council.*					
Stormwater Management Plan	Yes	Local and State	Yes	No	-
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). The Stormwater Management Plan was adopted in 2002 through Ordinance 06-02 and is administered by the Mayor and Council.*					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	No	-
Comment:					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local/State	No	No	-
Comment: *Business Improvement District.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	County	No	No	-
Comment: *The Transportation Plan was adopted in 2012 and is administered by the Planning Board.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	Local	-	No	-
Comment: *Business Development Plan*					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. The Plan is administered by OEM and is due for update in 2021.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	County	-	No	-
Comment: *Administered by OEM and adopted in 2010.*					
Continuity of Operations Plan	Yes	Local	Yes	Yes	-
Comment: *Included in the EOP and administered by OEM.*					
Public Health Plan	Yes	Local	Yes	Yes	-
Comment: *Included within EOP, the Borough shares a Health Department with Wayne.*					
Other	No	-	-	-	-
Comment:					

Table 9.10-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building permits (Building/Construction Office)
Does your jurisdiction have the ability to track permits by hazard area?	Yes, GIS
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, vacant lands inventory

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Pompton Lakes.

Table 9.10-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Borough Planning Board
Mitigation Planning Committee	Yes	Flood Advisory Board LEPC
Environmental Board / Commission	Yes	Environmental Protection Committee
Open Space Board / Committee	Yes	Open Space, Farmland and Recreation Committee
Economic Development Commission / Committee	Yes	Business Improvement District
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	CivicReady, website, emails
Maintenance program to reduce risk	Yes	Shade Tree Commission – Interlocal Agreement Storm Drain Cleaning
Mutual aid agreements	Yes	Police, Fire, and First Aid, interlocal agreement with Borough of Ringwood for storm drain cleaning, Borough of Bloomingdale for street sweeping
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	H2M Engineer Associates, Inc. and Ferriero Engineering, Inc.
Engineers or professionals trained in building or infrastructure construction practices	Yes	H2M Engineer Associates, Inc. and Ferriero Engineering, Inc.
Planners or engineers with an understanding of natural hazards	Yes	H2M Engineer Associates, Inc. and Ferriero Engineering, Inc.
Staff with training in benefit/cost analysis	Yes	Kevin Boyle, Administrator
Staff with training in green infrastructure	Yes	Landscape Architect

Staff/Personnel Resource	Available?	Department/Agency/Position
Staff with education/knowledge/training in low impact development	Yes	Maser Engineering/Planning Consultant
Surveyor	Yes	H2M Engineer Associates, Inc. and Ferriero Engineering, Inc.
Stormwater engineer	Yes	Engineering
Personnel skilled or trained in GIS applications	Yes	Agnoli Engineering/ H2M Engineer Associates, Inc.
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM Coordinator
Grant writers	Yes	Millennium Strategies
Resilience Officer	Yes	OEM Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of Pompton Lakes.

Table 9.10-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Pompton Lakes.

Table 9.10-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Public Information Officers under OEM
Do you have personnel skilled or trained in website development?	Yes

Criterion	Response
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes, flood information
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Facebook and Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes; Flood Advisory Board, Open Space Committee, Stormwater Committee, Flood Legislation Committee, CRS Committee, Climatology Committee, Program for Public Information.
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes; Newsletter, Awareness Seminar each March, Handouts for school kids
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; CivicReady, website, emails

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Pompton Lakes.

Table 9.10-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	Class 5	May 1, 2013 (entered CRS 10/1/11)
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	Class 4	Date
Storm Ready Certification	Yes	_____	October 2014
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	October 11, 2018

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The following summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.10-9. Adaptive Capacity of Climate Change

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	The Borough has a Climatology Committee that tracks precipitation. The borough tracks reservoirs (when they are

Criterion	Response
	filled, flooding is likely in the borough).

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms (*hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)*	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood (*riverine / flash flood, SLR*)	High
Geological Hazards (*landslides and subsidence/sinkholes*)	Medium
Hazardous Substances	Medium
Severe Weather (*high wind, tornado, TSTM, and hail*)	Medium
Severe Winter Weather (*heavy snow, blizzards, and ice storms*)	Medium
Wildfire	Medium

Notes:

High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;

Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.10-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building
Who is your floodplain administrator? (name, department/position)	Building Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	Apr-16
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Exceeds: the borough is a Class 5 in the CRS program
When was the most recent Community Assistance Visit or Community Assistance Contact?	Fall 2019
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	Yes, remapping of flood zones underway
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	No, the most recent maps expanded the floodplain beyond where the borough feels is appropriate.
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No, staff are highly trained and capable.
˜ If so, what type of assistance/training is needed?	

Criterion	Response
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	Yes, the borough would like to move from Class 5 to Class 4
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Flood insurance policies: 508 Insurance in force: $116,593,200 Premium in force: $1,032,592
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 2,529 Claims still open or closed without payment: 261 Total payments for losses: $53,489,567
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	Yes

**According to FEMA statistics as of 9/30/2018*

9.10.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough of Pompton Lakes made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Fire Department:** The Pompton Lakes Volunteer Fire Department is made up of a 100% volunteer force, approximately than 65 Firefighters in total. The Fire Department is comprised of two engine companies, one hook and ladder company and one rescue company all housed in the same quarters. The Department responds to all types of emergencies 24 hours a day, 7 days a week in the Borough of Pompton Lakes and assists neighboring towns through an established County-wide Mutual Aid Agreement when called upon. In 1962, a Fire Prevention Bureau was started to provide fire prevention education and to inspect buildings that are accessible to the public either as multi-housing, commercial or retail developments.
- **Emergency Management:** The Office of Emergency Management includes a Community Emergency Response Team (CERT). The Office also includes various educational information and outreach materials related to natural disasters on the emergency management page of the municipal website.
- **Emergency Operating Plan:** The Borough of Pompton Lakes Office of Emergency Management (OEM) is responsible for implementing, reviewing, and updating the Emergency Operating Plan. The Emergency Operating Plan (EOP) contains annexes for each borough department delineating what their responsibilities are in the event of an emergency or disaster. Where Borough departments cannot provide specific support services, outside agencies, such as the American Red Cross and Salvation Army, are contracted through verbal and written agreements to provide the service needed. The Emergency Operating Plan is reviewed and approved every four years by the New

Jersey State Office of Emergency Management. Annexes in the plan must be tested through functional, tabletop, and full-scale exercises.

- **Emergency Operating Center:** The Borough's Emergency Operating Center (EOC) is located adjacent to the police communications center in the municipal building. In times of crisis, all members of the Local Emergency Planning Committee (LEPC) respond to Borough Hall and meet to address the emergency. The LEPC meets twice a year, and more often if necessary.
- **Public Information:** The Borough of Pompton Lakes, its departments, and committees share notices about municipal government and its activities via social media to reach a broader audience and so that interested citizens can also share our information. The Borough has a Borough Newsletter that shares various information. The municipal website also hosts a flood readiness page, includes news flashes, and allows the public to sign up for emergency notifications.
- **Public Works:** The Office of Public Works is tasked with sweeping borough streets twice a month to prevent stormwater issues.
- **Planning Board:** The Planning Board consists of nine members who are designated by four different classes, and two alternate members. The Planning Board reviews and acts on site plan and subdivision applications. The Planning Board has the authority to prepare, adopt and amend or revise the Borough's Master Plan. Land use planning is a mechanism for governments to provide compatible uses of land for residents and businesses that preserve the character of a community.
- **Zoning Board of Adjustment:** The Zoning Board of Adjustment consists of seven members and four alternate members who are responsible for determining whether relief in the form of a variance can be granted. Mapped zones separate land uses and identifies areas for permitted uses. The Zoning Board reviews site plans and subdivision applications and determines whether relief in the form of a variance may be granted.
- **Redevelopment Agency:** The Pompton Lakes Redevelopment Agency was approved by the State of New Jersey Local Finance Board in June of 2014, and formally created in March of 2015 to oversee and help stimulate redevelopment efforts in the Borough of Pompton Lakes. The agency will primarily review conceptual plans of property owners for redevelopment, work with property owners to develop a cohesive, complimentary and consistent redevelopment of downtown Pompton Lakes, and formally designate the applicants as the re-developer of their property. The Agency It consists of seven members appointed by the Mayor, an Executive Director, Secretary and Assistant Secretary.
- **Pompton Lakes Utility Authority:** The Pompton Lakes Utility Authority is responsible for the Borough's water supply as well as its sewer collection and treatment.
- **GIS mapping**: The Borough of Pompton Lakes hosts an online GIS system on the municipal website.
- **Flood Advisory Board:** The Board assists Pompton Lakes' Municipal government on flood-related matters, and pursues means of mitigating flooding within the Borough. Recent activities includes an ongoing field assessment of river conditions, recommendations on priorities for clearing those obstructions, support of legislation aimed at relief from flooding, and involvement in the usage of land adjacent to or near flood zones. The Board oversees the Lake Restoration Committee and Stormwater Management Committee.
- **Flood Readiness page:** The municipal website hosts a Flood Readiness page which includes various information on flood risk, preparation, and safety tips. The page also hosts hurricane and tornado safety tips.

- **Lake Restoration Committee:** The PRIDE Lake Restoration Committee is a branch of the Flood Advisory Board and is committed to the care, improvement and management of our waterways. The Committee is currently focusing on the creation and implementation of a lake management plan for the long-term sustainability of Pompton Lake.
- **Stormwater Management Committee:** The Stormwater Management Committee is part of the Flood Advisory Board and a sibling of the Lake Restoration Committee. The goals of the Stormwater Management Committee are to improve water quality and reduce the volume of runoff entering the streams, rivers, and lakes in town. Bringing awareness to residents and businesses through educational programs and events are the Committee's primary tools.
- **Environmental Protection Committee:** The Pompton Lakes Environmental Protection Committee strives to promote the awareness and importance of the protection and preservation of wildlife habitats, wetlands, and recreation and conservation resources. Yearly, enthusiastic volunteers of all ages participate in the River Clean Up Program and coordinate their efforts to free waterways of debris. Other educational programs include: Earth Day awareness, stream monitoring and storm water identification. The Pompton Lakes Environmental Protection Committee serves as an advisory group to the Mayor and Council on environmental issues, laws, and programs and the committee welcomes new members.
- **Open Space Committee:** The Open Space Committee includes the Trails Maintenance Subcommittee and contributes to the borough's Open Space and Recreation Plan.
- **Shade Tree Commission:** The Shade Tree Commission consists of five commissioners and one alternate commissioner who oversee the regulation, planting and care of shade and ornamental trees and shrubberies located on Borough streets, highways, parks, public easements or rights-of way. The Borough has earned a Tree City, USA designation award for the seventh year in a row through the efforts of the Shade Tree Commission.
- **Community Emergency Response Team (CERT):** The Community Emergency Response Team (CERT) members partner with emergency management, local government, response agencies and community members. These volunteers are trained in basic response skills so as to prepare them to assist emergency responders in the event of any type of disaster.
- **Chemours/DuPont:** The former DuPont Pompton Lakes Works (PLW) manufacturing site covers 576 acres in the boroughs of Pompton Lakes and Wanaque in Passaic County, New Jersey. A residential area of the town of Pompton Lakes lies to the south and southeast of the former plant site. The former manufacturing facility produced blasting caps and other explosives over a 92-year period, including for the U.S. Government in World Wars I and II. Manufacturing operations at PLW ceased in 1994. During the site's operations, chemicals were used during the manufacturing processes to degrease and clean machines and metal parts. As part of a March 2008 investigation, overseen by representatives from the New Jersey Department of Environmental Protection (NJDEP) and United States Environmental Protection Agency (EPA), sub-slab vapor samples were collected from the soil beneath several homes in the local community to determine if the potential for vapor intrusion was present. Investigation results indicated that two VOCs, tetrachloroethene (PCE) and trichloroethene (TCE) were present in the soil vapor above screening criteria, indicating that additional studies were needed to determine if vapors were entering homes in the area. As defined by the New Jersey Department of Environmental Protection, Vapor Intrusion refers to the movement of volatile chemicals (VOCs – volatile organic compounds) from below the ground surface into overlying buildings. In May 2008, as a result of the initial investigation, NJDEP and

EPA approved a work plan for addressing the potential soil vapor pathway and potential vapor intrusion. As outlined in the approved NJDEP work plan, DuPont has agreed to conduct indoor air sampling and install a vapor mitigation system at no cost to homeowners to mitigate for possible vapor intrusion while indoor air sampling is being done. The vapor mitigation system is similar to a radon mitigation system and will prevent vapors from entering a home. A vacuum is applied below the foundation of the home and the vapors are vented outside of the home. These systems are highly effective and have been proven to work in thousands of homes across the United States.

- **Acid Brook Delta Cleanup:** USEPA issued a modification to the Pompton Lakes Works facility RCRA permit on June 22, 2015 to remove mercury impacted soils and sediment from Pompton Lake. The remedy encompasses four areas consisting of approximately 40 acres. The areas identified in the permit modification include upland soils between Rotary Park and the lake, the lake bottom adjacent to Rotary Park, and the lake bottom at two downstream locations. A Corrective Measures Implementation (CMI) work plan which describes the means and methods upon which the remedy will be completed was approved by USEPA on April 22, 2016. Field activities associated with the remedy will commence in early June 2016 consisting of the site preparation with soil removal in the upland areas starting in late June 2016. Environmental monitoring of surface water, air, and noise will be conducted in accordance with the CMI work plan during the removal phases of the remediation program.
- **Sustainable Jersey:** The Borough of Pompton Lakes is a bronze certified community in the Sustainable Jersey Program. The Borough earned points towards certification through several actions related to hazard mitigation including:
    - Emergency Communications Planning: The Borough of Pompton Lakes is up to date and thorough in regards to emergency communication planning. The OEM Director along with the work of the Pompton Lakes Police Department, Pompton Lakes Fire Department and CERT team regularly check the functionality of the communication plans.
    - Raingardens: The Borough of Pompton Lakes has installed several raingardens to control stormwater using green infrastructure.
    - Open Space Plan: In 2012, the Borough of Pompton Lakes put together an Open Space and Recreation Plan. The plan includes valuable information including the Natural Resources Inventory. The Open Space and Recreation Plan became part of the town's Master Plan shortly after is was published. The Plan also helped to created the Environmental Protection Committee. The ordinance adopting this establishment of the Environmental Protection Committee was passed on February 24, 2016. The Plan is updated by the Environmental Protection Committee and related town officials.
    - Municipal Communications Strategy: The Borough of Pompton lakes has numerous communication outlets to reach its residents. The uploaded checklist has up to date information regarding these outlets.

Opportunities for Future Integration

As this HMP update is implemented, the Borough of Pompton Lakes will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on

these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- Increased data on the impact of climate change would allow better planning and prevention. Refer to mitigation action 2020-Pompton Lakes-010.

9.10.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Pompton Lakes' history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.10-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.10-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6-7, 2018	Severe Winter Storm and Snowstorm (DR-4368)	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. CoCoRaHS observers and trained spotters reported 11 to 22 inches of snowfall. Significant tree damage was reported across Passaic county due to heavy wet snow and strong winds.	The Borough was reimbursed for snow removal.

9.10.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following summarizes the hazards of greatest concern and risk to the Borough of Pompton Lakes.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.10-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	11,205	100-year MRP Hurricane:	3,081	100-year MRP Hurricane:	$509,200	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	9,612	NEHRP D&E:	2,691	100-year MRP building damages/loss:	$51,225	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	1,267	Liquefaction Class 4:	427	500-year MRP building damages/loss:	$1,990,142	
						2,500-year MRP building damages/loss:	$31,020,026	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,533	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	616			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	2,416	1% annual chance	797	1% annual chance	$102,574,484	High
		0.2% annual chance	3,171	0.2% annual chance	1,827			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	0	Class A:	9	Class A:	$11,176,642	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	3	Replacement cost value of buildings located in the hazard area:	$49,277,082	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Pompton Lakes.

- Number of repetitive loss (RL) properties: 151
- Number of severe repetitive loss (SRL) properties: 168
- Number of RL/SRL properties that have been mitigated: 69 homes acquired (two properties through CDBG-DR), 17 structures elevated.

Source: FEMA March 2019
Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.10-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Lakeside School*	Shelter		X	
Lincoln E.S.	School		X	
Pompton Lakes DPW	DPW		X	
Pompton Lakes MUA	Wastewater Treatment*	X	X	Protected from flooding, via elevation and floodproofing.
Well 1	Well*	X	X	Wellhouse is elevated and wells are sealed.
Well 2	Well*	X	X	Wellhouse is elevated and wells are sealed.

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- Need additional tide gauge south of convergence of the Wanaque river and Pequannock River.
- Norton House Bridge was reconstructed without vents or flow through capabilities above the deck. This diverts flow to the sides of the bridge.
- Flood mitigation and control of the Pompton River is not being done in a fully coordinated fashion.
- The Carnevale Center, the primary shelter, lacks a generator.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Pompton Lakes that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Pompton Lakes has significant exposure. Maps of the Borough of Pompton Lakes hazard

area extent and location are provided later in this section. This map indicates the location of the regulatory floodplain, as well as identified critical facilities within the municipality.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; and community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the Borough of Pompton Lakes. The Borough of Pompton Lakes has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough indicated the following:

- The Borough changed the hazard ranking for coastal storm from high to low.
- The Borough agreed with the remainder of the calculated hazard rankings.

Table 9.10-14. Borough of Pompton Lakes Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Low	Low	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Severe Weather	Severe Winter Weather	Wildfire
High	Low	Medium	Medium	Medium	Low

9.10.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.10-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Pompton-1: Ensure continuity of operations and critical facilities and infrastructure: 1.Generators for Critical Facilities including EMS/Civic Center	OEM	Complete		
Pompton-2: Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress). Phase 2: Work with the property owners to implement selected action based on available funding and local match availability. Currently identified projects: 1. Acquisitions identified through the HMGP funding program ($4,161,300) 2. Acquisitions identified through CDGB-DR funding ($584,000)	Engineering	In progress; Took down 60 homes, elevated 15 homes	X- encourage elevations	2020-Pompton Lakes-001
Pompton-3: Continue desnagging and desilting operations, targeting areas of need on each river, as identified by the hazard assessments performed by the PLEO, PL FAB, and Borough Engineer.	Borough of Pompton Lakes	In progress	X	2020-Pompton Lakes-002
Pompton-4: Address the river constriction issues on the Ramapo River at the Dawes Highway bridge by constructing either a set of bypass channels or another diversion or storage structure.	County	No progress; Old bridge creates restriction. Work with County and Wayne to replace bridge.	X	2020-Pompton Lakes-003
Pompton-5: Revise the Borough ordinance as it relates to stormwater management to require reductions in runoff and increase in infiltration at all new construction and redevelopment projects.	Borough of Pompton Lakes	Complete		
Pompton-6: Create a long-term plan for the implementation of low impact development and current best management practices for stormwater management, with a goal of reducing run off and increasing infiltration of stormwater on roadways and other public property.	State	Complete, ongoing		
Pompton-7: Create a public outreach and education program to inform residents about stormwater	Borough of Pompton Lakes	Complete, ongoing		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
management and encourage residents to reduce runoff on their own properties.				
Pompton-8: Stabilize and restore the bank of the Pequannock River at the northern border of Pompton Lakes, across the river from Morris Avenue (Riverdale)	Borough of Pompton Lakes	Complete		
Pompton-9: Continue the acquisition and removal of homes along River Edge Drive, with the intention of construction additional flood storage along the Ramapo River.	FEMA	In progress	X	2020-Pompton Lakes-004
Pompton-10: Integrate the creation and maintenance of flood storage areas into the creation of a greenway along the Ramapo and Pequannock Rivers, including a portion of the Morris Canal greenway.	Borough of Pompton Lakes	Complete; Morris canal greenway, created retention areas in south end of town as well.		

In addition to the above progress, the Borough of Pompton Lakes identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- Drone survey has been done to map rivers. When tree comes down, they know if it will be an issue and needs restoration, contractor able to go forward.
- Garden Road Pond had underground overflow pipe that was damaged. Borough has replaced the pipe.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Pompton Lakes participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Pompton Lakes participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.10-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Pompton Lakes would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the

occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.10-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Pompton Lakes-001	Support the mitigation of vulnerable structures via retrofit	Flood prone properties are vulnerable to repetitive flood damages.	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable.	Existing	Flood, Severe Storm	1, 2	FPA, Engineering	FEMA HMGP and FMA, local cost share by residents	Reduction in flood damage to properties.	$3 million	5 years	High	SIP	PP
2020-Pompton Lakes-002	Desnagging and desilting operations	Snags and silting can result in flooding.	Complete drone survey of areas that are prone to snags and silting. Use this information to complete desnagging and desilting operations.	N/A	Flood	1, 2	Borough of Pompton Lakes	Municipal budget	Reduction in flood risk.	TBD by drone survey.	Ongoing	High	NSP	NR
2020-Pompton Lakes-003	Address the river constriction issues on the Ramapo River at the Dawes Highway bridge	Old bridge creates restriction. Work with County and Wayne to replace bridge.	Address the river constriction issues on the Ramapo River at the Dawes Highway bridge by working with the State and County to	Existing	Flood	1, 2	County, State	County And State Budget	Reduction in flood risk.	TBD by engineering study	Within 5 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			construct either a set of bypass channels or another diversion or storage structure.											
2020-Pompton Lakes-004	Acquire homes along River Edge Drive	Homes along River Edge Drive are flood prone	Continue the acquisition and removal of homes along River Edge Drive, with the intention of construction additional flood storage along the Ramapo River.	Existing	Flood, Severe Storm	1, 2	NFIP Floodplain Administrator, NJOEM, FEMA, County	FEMA HMGP, FMA	Properties removed from flood plain.	$225,000 per home	6-12 months	High	SIP	PP
2020-Pompton Lakes-005	Secure ongoing permit for stream clearing	Drone survey has been done to map rivers. When tree comes down, they know if it will be an issue and needs restoration, contractor able to go forward.	Work with NJ DEP to secure an ongoing permit for stream clearing.	N/A	Flood	1, 2	Borough, NJ DEP	Municipal budget	Ability to quickly clear downed trees.	Staff time	Within 1 year	High	LPR	ES
2020-Pompton Lakes-006	Tide gauge on Pequannock River	Need additional tide gauge south of convergence of the Wanaque river and Pequannock River.	Work with USGS and NWS for gauge. Already have existing location for installation set	N/A	Flood	4, 5, 6	OEM	USGS, NWS	Increased flood warning	$20,000	Within 5 years	High	LPR	ES
2020-Pompton	Mitigate Norton House Bridge to	Norton House Bridge was reconstructed	Put vented sides or guardrail on bridge that	Existing	Flood	1, 2	Engineering	HMGP, PDM, FMA	Reduced	$75,000	Within	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
Lakes-007	reduce flooding.	without vents or flow through capabilities above the deck. This diverts flow to the sides of the bridge.	would prevent water from being diverted to the side of the bridge.						flood risk		5 years			
2020-Pompton Lakes-008	Regional analysis of Pompton River	Flood mitigation and control of the Pompton River is not being done in a fully coordinated fashion	Regional analysis and control of the Pompton River.	Existing and future	Flood	4, 5	Engineering	HMGP, FMA, PDM, Municipal Budget	Decrease in flood risk	TBD by regional analysis	Within 5 years	High	LPR, SIP	PR, SP
2020-Pompton Lakes-009	Storm sewer repairs and improvements	The following locations have drainage issues: Riverdale Road at Van Ness and Dawes Highway in the block between Olive and Woodlawn, Lincoln Avenue north of Hamburg up to Romaine Avenue, Magnolia Ave and Lincoln Avenue.	The Engineering Department will design improvements to address drainage issues. Public works will carry out the improvements.	Existing	Flood, Severe Storm	1, 2	Engineering, Public Works	HMGP, PDM, municipal budget	Increase drainage, decreased flood risk	$150,000	Within 5 years	High	SIP	SP
2020-Pompton Lakes-010	Climate Data Analysis	Climate change is resulting in a change to the flood regime in the Borough.	The Borough will gather and review climate change studies that pertain to the local flood condition and	New and Existing	Flood	3, 4	Flood Advisory Board	Municipal Budget	Improved long term flood strategy	Staff time	Within 2 years	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			develop flood actions and strategies based on this analysis.											
2020-Pompton Lakes-011	Native Plant Restoration	Invasive species have degraded natural habitats in the Borough that absorb floodwaters and prevent runoff.	Complete an invasive species inventory and remove invasives. Restore impacted habitats.	N/A	Invasive Species	3, 4	Flood Advisory Board	Municipal Budget	Improved natural floodplain functions	TBD by inventory	Within 5 years	High	NSP	NR
2020-Pompton Lakes-012	Public Education regarding compost and yard waste along riverbank	Property owners on the riverbank have occasionally used the riverbank for compost and yard waste purposes. This contributes to increased flood risk.	Complete outreach and public education to property owners.	N/A	Flood	3	Flood Advisory Board	Municipal Budget	Increased knowledge	$1,000	1 year	High	NSP	NR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*

- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.10-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Pompton Lakes-001	Support the mitigation of vulnerable structures via retrofit	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Pompton Lakes-002	Desnagging and desilting operations	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Pompton Lakes-003	Address the river constriction issues on the Ramapo River at the Dawes Highway bridge	1	1	1	0	1	0	0	1	1	1	0	0	1	1	9	High
2020-Pompton Lakes-004	Acquire homes along River Edge Drive	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Pompton Lakes-005	Secure ongoing permit for stream clearing	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Pompton Lakes-006	Tide gauge on Pequannock River	1	0	1	1	1	0	0	1	1	1	0	0	1	1	9	High
2020-Pompton Lakes-007	Mitigate Norton House Bridge to reduce flooding.	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High
2020-Pompton Lakes-008	Regional analysis of Pompton River	1	1	1	1	1	1	0	1	1	0	0	0	1	1	10	High
2020-Pompton Lakes-009	Storm sewer repairs and improvements	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Pompton Lakes-010	Climate Data Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Pompton Lakes-011	Native Plant Restoration	0	1	1	1	1	1	1	1	1	1	0	0	1	1	11	High
2020-Pompton Lakes-012	Public Education regarding compost and yard waste along riverbank	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.10-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms								
Dam Failure								
Disease Outbreak								
Drought								
Earthquake								
Extreme Temperature								
Flood	2020-Pompton Lakes-008, 2020-Pompton Lakes-010	2020-Pompton Lakes-001, 2020-Pompton Lakes-003, 2020-Pompton Lakes-004, 2020-Pompton Lakes-007		2020-Pompton Lakes-002, 2020-Pompton Lakes-011, 2020-Pompton Lakes-012	2020-Pompton Lakes-005, 2020-Pompton Lakes-006	2020-Pompton Lakes-008, 2020-Pompton Lakes-009	2020-Pompton Lakes-010	2020-Pompton Lakes-010
Geological Hazards								
Hazardous Substances								
Severe Weather		2020-Pompton Lakes-001, 2020-Pompton Lakes-004				2020-Pompton Lakes-009		
Severe Winter Weather								
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.10.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Pompton Lakes followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.10-19. Contributors to the Annex

Entity	Title	Method of Participation
Albert Evangelista	OEM Coordinator	Primary POC, attended plan participant meetings, provided impact data, contributed to the mitigation strategy.
Kevin R. Boyle	Administrator	Secondary POC
Sal Poli	Construction Official	NFIP Floodplain Administrator, provided impact information
Pompton Lakes Flood Advisory Board	-	Contributed to the mitigation strategy

Figure 9.10-1. Borough of Pompton Lakes Hazard Area Extent and Location Map

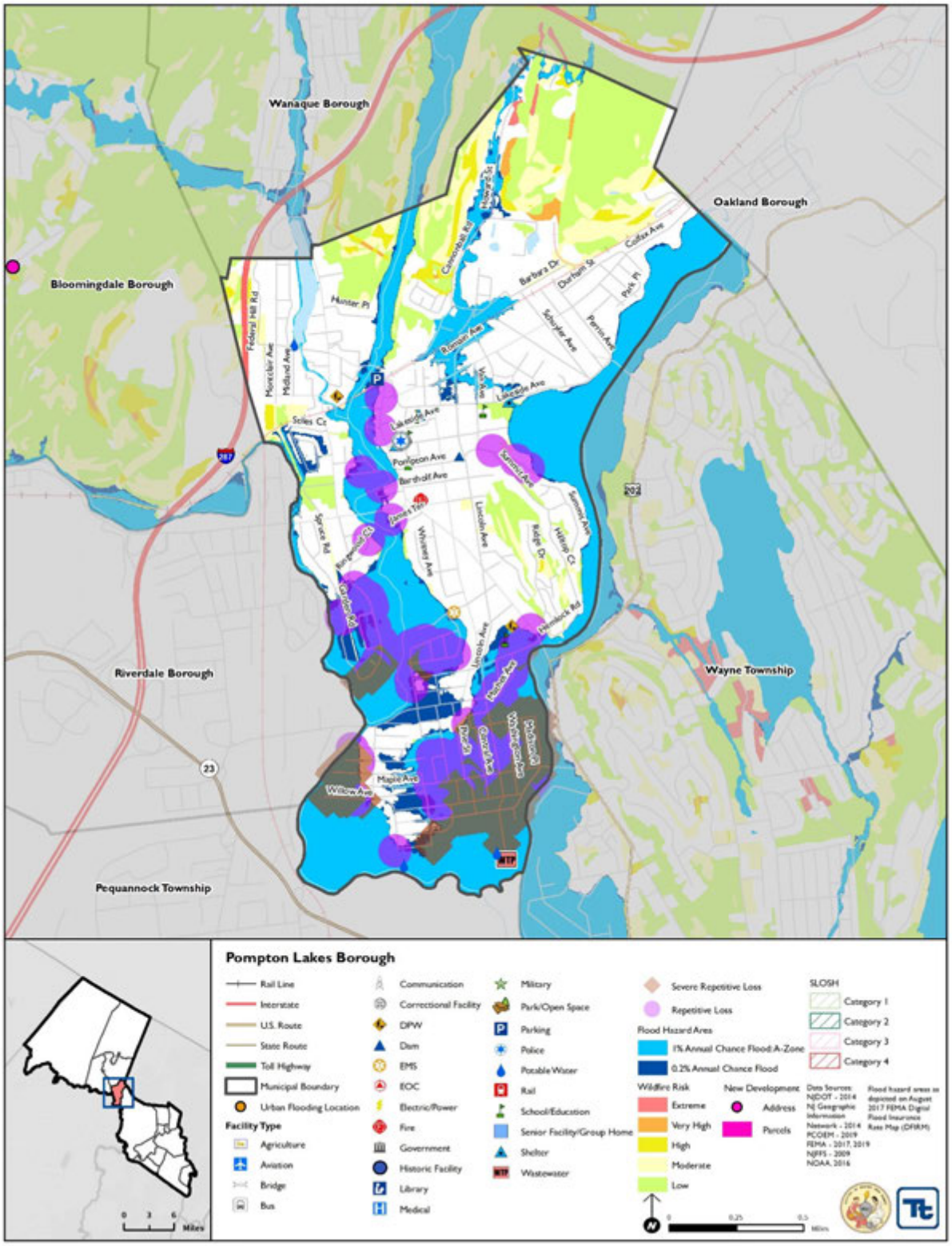
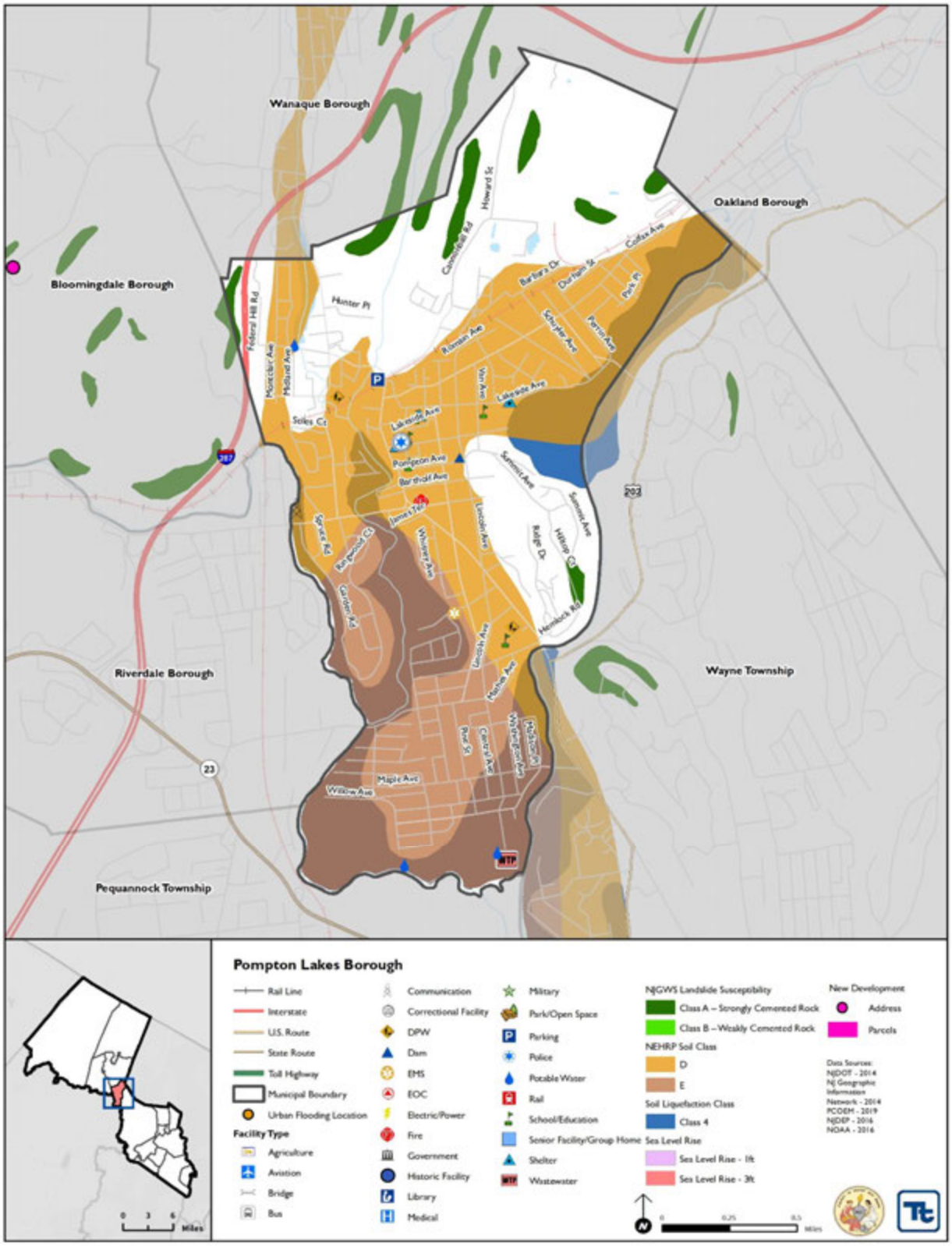


Figure 9.10-2. Borough of Pompton Lakes Hazard Area Extent and Location Map



Action Worksheet			
Project Name:	Support the mitigation of vulnerable structures via retrofit		
Project Number:	2020-Pompton Lakes-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in 237 repetitive loss properties and 86 severe repetitive loss properties.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 30 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$3Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Five years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, Engineering, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Support the mitigation of vulnerable structures via retrofit	
Project Number:	2020-Pompton Lakes-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from areas of Borough where acquisitions are used.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Acquire homes along River Edge Drive		
Project Number:	2020-Pompton Lakes-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Homes along River Edge Drive are flood prone.		
Action or Project Intended for Implementation			
Description of the Solution:	Continue the acquisition and removal of homes along River Edge Drive, with the intention of construction additional flood storage along the Ramapo River.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$3Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Five years	**Potential Funding Sources:**	FEMA HMGP and FMA
Responsible Organization:	NFIP Floodplain Administrator, NJOEM, FEMA, County	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Acquire homes along River Edge Drive	
Project Number:	2020-Pompton Lakes-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from areas of Borough
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Mitigate Norton House Bridge to reduce flooding.		
Project Number:	2020-Pompton Lakes-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Norton House Bridge was reconstructed without vents or flow through capabilities above the deck. This diverts flow to the sides of the bridge.		
Action or Project Intended for Implementation			
Description of the Solution:	Put vented sides or guardrail on bridge that would prevent water from being diverted to the side of the bridge.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	Allow floodwater to pass through	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	25 years	**Goals Met:**	1, 2
Estimated Cost:	$75,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Within Five years	**Potential Funding Sources:**	FEMA HMGP, PDM
Responsible Organization:	Engineering	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not solve problem caused by bridge to neighboring homes

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Mitigate Norton House Bridge to reduce flooding.	
Project Number:	2020-Pompton Lakes-007	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Reduces flood risk to life
Property Protection	1	Reduces flood risk to property
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	Within 5 years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Storm sewer repairs and improvements		
Project Number:	2020-Pompton Lakes-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The following locations have drainage issues: Riverdale Road at Van Ness and Dawes Highway in the block between Olive and Woodlawn, Lincoln Avenue north of Hamburg up to Romaine Avenue, Magnolia Ave and Lincoln Avenue.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineering Department will design improvements to address drainage issues. Public works will carry out the improvements.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	Dependent on engineering design.	**Estimated Benefits (losses avoided):**	Increase drainage, decreased flood risk
Useful Life:	30 years	**Goals Met:**	1, 2
Estimated Cost:	$150,000	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP, PDM, municipal budget
Responsible Organization:	Engineering, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$500,000 per roadway	Costly and may not solve problem
	Relocate roadways	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Storm sewer repairs and improvements	
Project Number:	2020-Pompton Lakes-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from flooding.
Property Protection	1	Protects culvert from flood damage
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	Within 5 years
Agency Champion	1	Engineering and Public Works
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.11 BOROUGH OF PROSPECT PARK

This section presents the jurisdictional annex for the Borough of Prospect Park. The annex includes a general overview of the Borough; an assessment of the Borough of Prospect Park's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.11.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Prospect Park's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.11-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Ariosto Rodriguez, OEM Coordinator 106 Brown Ave., Prospect Park, NJ 07508 973-288-5729 ProspectParkOEM@prospectpark.net	Yeisy Reyes, Deputy OEM Coordinator 106 Brown Ave., Prospect Park, NJ 075 973-641-8435 yreyesjr@live.com
NFIP Floodplain Administrator	
Kenneth Valt, DPW Supervisor 106 Brown Ave., Prospect Park, NJ 075 973-296-0101 valtk@prospectpark.net	

9.11.2 Jurisdiction Profile

The early Dutch settlements in the area built a strong sense of community that has grown alongside the Borough's growth. The Prospect Park Quarry was opened in 1901, the same year as the Borough's incorporation as an independent municipality. The Quarry remained opened and owned by multiple families and companies until the 1980's. After its closure, Tilcon employed a mineral collector to identify and preserve minerals and crystals that can be seen on display at the Smithsonian, the American Museum of Natural History and the Paterson Museum. Today, Prospect Park is governed by the Borough form of government (Borough of Prospect Park 2014).

According to the U.S. Census Bureau, the Borough has a total land area of 0.478 square miles, of which 0.475 square miles is land and 0.003 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Prospect Park was 5,865. The estimated 2017 population was 5,955, a 1.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 7.5 percent of the population is 5 years of age or younger and 8 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.11.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.11-2 summarizes recent and expected future development trends, including major

residential/commercial development and major infrastructure development. Figures 9.11-1 and 9.11-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.11-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	0	0	0	0	0
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Hofstra Park - made renovations, added structures, increased safety and security of residents at the park	Recreation	N/A	298 Prescott Ave	None	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Quarry	Residential and Commercial	Zoned for 720 units	100 Planten Avenue	None	Redevelopment agreement before any work is done; proposing 3 phases - trying to agree to a financial agreement
North 8th Street - Veterans/Affordable Housing complex	Residential	~260 units	316 and 318 North 8th Street	None	In development

** Only location-specific hazard zones or vulnerabilities identified.*

9.11.4 Capability Assessment

The Borough of Prospect Park performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment below. The Borough of Prospect Park identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Prospect Park.

Table 9.11-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	-	-
***Comment**: State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.)*					
Zoning Code	Yes	Local	Yes	-	-
***Comment:** Updated 11/23/2009; Section 90 – Planning/Engineering*					
Subdivisions	Yes	Local	Yes	-	-
Comment: Land development ordinance includes zoning and subdivision - Planning/Engineering					
Stormwater Management	Yes	Engineer	Yes	-	-
Comment:					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
***Comment:** N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	-	-	-
Comment: Trying to encourage growth					
Site Plan Review	Yes	Local	Yes	-	-
Comment: Site Plan Review is in the land development ordinance - Planning/Engineering/Zoning Officer performs the reviews					
Environmental Protection	Yes/No	Who enforces?	No	Yes/No	Yes/No
Comment:					
Flood Damage Prevention	Yes	Local	Yes	-	-
***Comment:** Section 90 – Land Development*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	Yes/No	Who enforces?	No	Yes/No	Yes/No
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	Yes/No	Who enforces?	No	Yes/No	Yes/No
Comment:					
Disaster Reconstruction Ordinance	Yes/No	Who enforces?	No	Yes/No	Yes/No

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local - Planning	Yes	-	-
Comment: *In 2009, the master plan re-examination was adopted on February 26, 2009.*					
Capital Improvement Plan	Yes	Local	No	Yes/No	Yes/No
Comment: Comment: The CFO and Finance Committee are responsible for enforcing; capital improvement projects are included in the annual budget					
Disaster Debris Management Plan	Yes/No	Who enforces?	No	Yes/No	Yes/No
Comment:					
Floodplain or Watershed Plan	No	-	-	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	-	-
Comment: *Adopted in 2017 - Engineer*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	-	-
Comment: *Part of the Stormwater Management Plan*					
Urban Water Management Plan	Yes	Local	No	Yes/No	Yes/No
Comment: *Through the Borough Engineer - need date*					
Habitat Conservation Plan	No	-	-	-	-
Comment:					
Economic Development Plan	No	-	-	-	-
Comment: *While not a standalone plan, it is partially addressed in the Borough's master plan*					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	Yes	Local	No	Yes/No	Yes/No
Comment: Through the fire department					
Community Forest Management Plan	Yes	Local	No	Yes/No	Yes/No
Comment: *75-19 of the municipal code*					
Transportation Plan	No	-	-	-	-
Comment:					
Agriculture Plan	No	-	-	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	-	-
Comment: *EOP was updated in 2014; the Borough is currently working on an update*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	-	-	-
Comment:					
Continuity of Operations Plan	No	-	-	-	-
Comment:					
Public Health Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					

Table 9.11-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Planning and Land Use Board
Does your jurisdiction have the ability to track permits by hazard area?	Yes - Engineering
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No - Borough is fully developed; State has designated 'Opportunity Zone' - the only land available for redevelopment is the quarry which is in the works

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Prospect Park.

Table 9.11-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use (planning and zoning) board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Code Red - mass text, email, reverse 911; social media - Facebook; Borough website – all are used to notify residents of emergency messages and notifications
Maintenance program to reduce risk	Yes	DPW – 250 storm basins are inspected monthly DEP – part of the stormwater
Mutual aid agreements	Yes	Public Works (Hawthorne and North Haledon, Haledon, Clifton, County, Garfield (Bergen County), Paterson, Little Falls), Fire Department, Law Enforcement, Library Services (Hawthorne)
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering
Planners or engineers with an understanding of natural hazards	Yes	Engineering
Staff with training in benefit/cost analysis	Yes	Engineering
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	Yes	Land Use and Planning Board
Surveyor	Yes	Engineering
Stormwater engineer	Yes	Consultant Engineering
Personnel skilled or trained in GIS applications	Yes	Engineering and Planning
Local or state water quality professional	Yes	Passaic Valley Water
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management
Watershed planner	No	-
Environmental specialist	Yes	Consultant Engineering
Grant writers	Yes	Capital Alternatives (consultant)
Resilience Officer	No	-
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of Prospect Park.

Table 9.11-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Prospect Park.

Table 9.11-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - Borough Administrator
Do you have personnel skilled or trained in website development?	No - borough outsources the website
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes - The website has information regarding local news and events, link to sign up for community and emergency notifications, and contact information for municipal departments
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes - The Borough has a Facebook page where they post municipal information, emergency alerts, events, and countywide information
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes - Newsletter, borough calendar, school calendar
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - Code Red - mass text, email, reverse 911; social media - Facebook; and municipal website

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Prospect Park.

Table 9.11-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)			
Public Protection (Fire ISO Protection Class)	Yes		
Storm Ready Certification	No	-	-

Program	Participating?	Classification	Date Classified
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for climate change and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	Medium

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.11-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Public Works
Who is your floodplain administrator? (name, department/position)	Ken Valt, DPW
Are any certified floodplain managers on staff in your jurisdiction?	Yes - engineer

Criterion	Response
What is the date that your flood damage prevention ordinance was last amended?	Not available
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	N/A
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? • If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No Not at this time
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	2 $739,400.00 $2,095.00
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	2 0 $103,567.39
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of XXXX*

Additional Areas of Existing Integration

- **Master Plan 2009:** This Plan focuses on maintaining the existing character and identity of the Borough, while planning for future development and redevelopment. The North 8th Street and Haledon Ave commercial districts are underutilized, and the former Tilcon Quarry remains closed and unused as well; these areas offer opportunities for growth and redevelopment to enhance the residential and commercial structure of the Borough. The Borough seeks to preserve and expand its open space and recreational facilities to improve the health of its residents and the environment. Proposed plans for the redevelopment of the Tilcon Quarry include using smart growth and sustainable design ideas, such as solar orientation and energy management, drought tolerant and native landscaping, high efficiency irrigation systems and natural filtration of stormwater.
- **Stormwater Pollution Prevention Plan (2006):** This Plan outlines how the Borough will monitor and enforce pollution prevention and stormwater management in accordance with the guidelines and standards required by the NJDEP. The Plan also lists the Borough's ordinances that pertain to the reduction of various forms of pollution. The DPW has a stormwater maintenance schedule to inspect, maintain and clear the stormwater drains monthly and after events.
- **Ordinances:** The Borough does not have their ordinances and flood protection measures available on their website.
- **Outreach:** The Borough's website has information regarding upcoming community events and public health notices, including free flu shot clinics for their residents. The site also has a webpage for the Office of Emergency Management, which provides information about the Office and its contact information. The

website is used to post information on preparedness for natural hazard and weather events. The Borough also recently established a Facebook account to communicate with residents. Further, the school system notifies parents via Reverse 911.

- **Mutual Aid/Cooperative Agreements:** The schools and the Fire Department work together to bring fire prevention into the schools including education on carbon monoxide monitoring, smoke detectors, evacuation/escape plan, and drills.
- The elementary school has a dedicated full-time police officer that services the school. Similarly, the regional high school, has a dedicated officer supplied by Haledon. The schools also offer a Drug Abuse Resistance Education (DARE) program.

9.11.5 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Prospect Park's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.11-10 provides details regarding municipal-specific loss and damages the Borough of Prospect Park experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.11-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed.	While this event impacted the County overall, the Borough did not have significant damages associated with this event.
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County.	While this event impacted the County overall, the Borough did not have significant damages associated with this event.
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	While this event impacted the County overall, the Borough did not have significant damages associated with this event.

9.11.6 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.11-11 summarizes the Borough of Prospect Park risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.11-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	5,955	100-year MRP Hurricane:	1,101	100-year MRP Hurricane:	$253,068	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	86	NEHRP D&E:	19	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$6,954,198	
						2,500-year MRP building damages/loss:	$97,340,638	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	491	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	1,137			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	0	1% annual chance	2	1% annual chance	$164,905	High
		0.2% annual chance	98	0.2% annual chance	21			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	0	Class A:	1	Class A:	$272,232	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	0	Replacement cost value of buildings located in the hazard area:	$0	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Prospect Park.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.11-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
There are no identified critical facilities located in the floodplain				

Additional Identified Vulnerabilities

The Borough of Prospect Park is impacted by flooding from the Passaic River, Pequannock River, and Wanaque River. The low-lying areas of the Borough are typically the areas most likely to flood (FEMA FIS 2007).

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Prospect Park that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Prospect Park has significant exposure. A map of the Borough of Prospect Park hazard area extent and location is provided on the following page. This map indicates the location of the regulatory floodplain, as well as identified critical facilities within the municipality.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Prospect Park. The Borough of Prospect Park has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

Table 9.11-13. Borough of Prospect Park Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Low	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Medium	Medium	Medium	Low

9.11.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.11-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to ensure continuity of operations. The following locations have been identified: 1. Borough Hall (EOC) – natural gas connection for generator 2. Public Works Garage	DPW	No Progress	Include in the 2020 HMP	2020-PROSPECT PARK-001
Increase stormwater pipe capacity on roads including Haledon Ave to reduce stormwater flooding.	DPW	No Progress – the Borough does not have jurisdiction over Haledon Avenue and cannot implement this project	Discontinue	-
Develop a shelter plan to identify proper sheltering for residents considering neighboring communities.	OEM	No Progress	Include in the 2020 HMP	2020-PROSPECT PARK-002
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	Ongoing Capability – there is minimal flooding in the Borough and no RL or SRL properties. If there is interest in mitigation, the Borough will support the mitigation of vulnerable structures	-	-

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Conduct and develop studies and plans for the Borough. The following have been identified to date, many of which are centered on transportation. 1. School Walking Plan using the Safe Routes 2 Schools Grant - check the conditions of the sidewalks, clear path/no low hanging branches, crosswalks, signs in good condition, crossing guards where necessary, etc. 2. Bicycle Master Plan - creating a plan to interconnect residents with parks, schools, shopping, work and other point of interest 3. Circulation Element of the Master Plan (start from scratch). Better connections between the new development with the existing street network and better connections to the region. 4. Feasibility of shuttle buses between the new development and various points of interest - transportation facilities, shopping and working locations - so people are not so dependent upon their personal vehicle 5. Traffic calming studies - the development should consider traffic calming in their street designs 6. Complete Streets - the Borough should adopt a Complete Streets policy 7. Identify high frequency crash locations throughout the Borough and develop mitigation measures to address the cause of the crashes, such as sight distance issues. Also, conduct traffic counts at these intersections to prepare the mitigation studies. 8. Review the current truck routes especially if deliveries to the new development would make trucks use other streets that they did not use before.	Planning	In Progress – the Borough is currently working on implementing this project. 1. School Walking Plan – related to the school traffic study completed for the Borough. 2. Bicycle Master Plan – the only section that was completed was Haledon Avenue (county road) and the path is not feasible for the Borough because the streets to the parks are one-way streets and adding a bike path will not work. 3. Circulation element of master plan – no progress; include in 2020 HMP 4. Feasibility of shuttle buses – no progress; include in 2020 HMP 5. Traffic study – complete 6. Complete streets - ongoing 7. High frequency crash locations – complete 8. Truck routes – complete	Include item 3 and 4 in 2020 HMP	2020-PROSPECT PARK-004

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Prospect Park participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Prospect Park participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.11-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Prospect Park would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria were used to evaluate each action, including an evaluation of the benefits and costs. For each new mitigation action, a numeric rank was assigned (-1, 0, or 1) for each of the 14 evaluation criteria. The results of this evaluation, in addition to input from the jurisdiction, were then used to prioritize the mitigation initiatives as 'High', 'Medium', or 'Low.' Table 9.11-17 summarizes the evaluation of each mitigation initiative and the resulting priority, listed by Action Number.

Table 9.11-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-PROSPECT PARK-001	Backup Generators	**Problem**: The Borough Hall and Public Works Garage currently do not have backup power. During an outage, they cannot function properly and provide the essential services they provide to residents. **Solution**: Purchase and install permanent generators at the Borough Hall, which serves as the EOC, and the public works garage.	Existing	Coastal Storm, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Severe Weather, Severe Winter Weather, Wildfire	6	Borough Administration and Public Works	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Continuity of operations, essential services to the community	$50,000	Within 2 years	High	SIP	PP, ES
2020-PROSPECT PARK-002	Sheltering Plan	**Problem**: The Borough currently does not have a formal shelter plan in place. In the event a shelter is needed, there is no formal plan or procedure to follow. **Solution**: Develop a shelter plan to identify proper sheltering for residents considering neighboring communities. The plan will include designating a shelter coordinator, develop an MOU with American Red Cross or Passaic County, identify shelter facilities and ensure agreements are in place, and train staff to maintain shelters.	New and Existing	Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Severe Weather, Severe Winter Weather, Wildfire	1, 2, 6	Borough OEM and Administration	FEMA PDM	Provide steps to opening and running a shelter in the Borough	$40,000	Within 3 years	High	LPR	PR, ES
2020-PROSPECT PARK-003	Municipal Codes Online	**Problem**: The Borough's municipal codes are not available online. This does not make them easily accessible to residents and businesses.	New and Existing	Coastal Storm, Dam Failure, Disease Outbreak, Drought,	All	Borough Administration	Municipal Budget	Accessibility of codes to the community	$5,000+	Within one year	High	LPR	PR, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: Create an online code book to provide the codes to residents and businesses. This will allow the Borough to more effectively serve residents. It will also allow users to search and print codes.		Earthquake, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Severe Weather, Severe Winter Weather, Wildfire									
2020-PROSPECT PARK-004	Circulation Element of Master Plan	**Problem:** The Borough's Master Plan does not contain a circulation element. By not having this element, the Borough does not have set goals, policies or a general plan in place that addresses transportation (cars, people, public transportation) in the Borough. **Solution:** Develop a circulation element of the Borough's master plan. This element will show the location and types of all facilities for all modes of transportation required for the efficient movement of people and goods into, around, and through the Borough. The element will include details on shuttle bus feasibility in the Borough. This will provide better connections between new development with the existing street network and better connections in the region.	New and Existing	Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Severe Weather, Severe Winter Weather, Wildfire		Borough Planning, Borough Engineer	Municipal Budget	Provide better connections between new development with the existing street network and better connections in the region	$60,000	Within 3 years	Medium	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.11-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-PROSPECT PARK-001	Backup Generators	1	1	1	1	1	1	0	0	1	1	1	1	1	0	11	High
2020-PROSPECT PARK-002	Sheltering Plan	1	1	1	1	1	0	0	0	1	1	1	1	1	0	10	High
2020-PROSPECT PARK-003	Municipal Codes Online	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-PROSPECT PARK-004	Circulation Element of Master Plan	1	1	1	1	0	0	1	0	0	1	1	1	0	0	8	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

Table 9.11-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Dam Failure	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Disease Outbreak	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Drought	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Earthquake	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Extreme Temperature	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Flood	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Geological Hazards	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Hazardous Substances	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
								Prospect Park-003
Infestation and Invasive Species								2020-Prospect Park-003
Severe Weather	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Severe Winter Weather	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003
Wildfire	2020-Prospect Park-004				2020-Prospect Park-001	2020-Prospect Park-001		2020-Prospect Park-002; 2020-Prospect Park-003

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.11.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Prospect Park followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.11-18. Contributors to the Annex

Entity	Title	Method of Participation
Bill Mullanaphy	Deputy OEM Coordinator	Attended meetings; provided data and information for the annex update
Yeisy Reyes, Jr.	Deputy OEM Coordinator	Attended meetings; provided data and information for the annex update
Intashan Chowdhury, MPA	Administrator	Attended meetings; provided data and information for the annex update
Ken Valt	DPW Superintendent	Attended meetings; provided data and information for the annex update
Hana Hataf	Finance	Attended meetings; provided data and information for the annex update
Ariosto Rodriguez	OEM Coordinator	Attended meetings; provided data and information for the annex update
Farah Gilani	Engineer	Reviewed the annex

Entity	Title	Method of Participation
Paul Ricci	Land Use Planner	Reviewed the annex
James Booth	Fire Official	Reviewed the annex
Captain Ammen Matari	Police Official	Reviewed the annex

Figure 9.11-1. Borough of Prospect Park Hazard Area Extent and Location Map 1

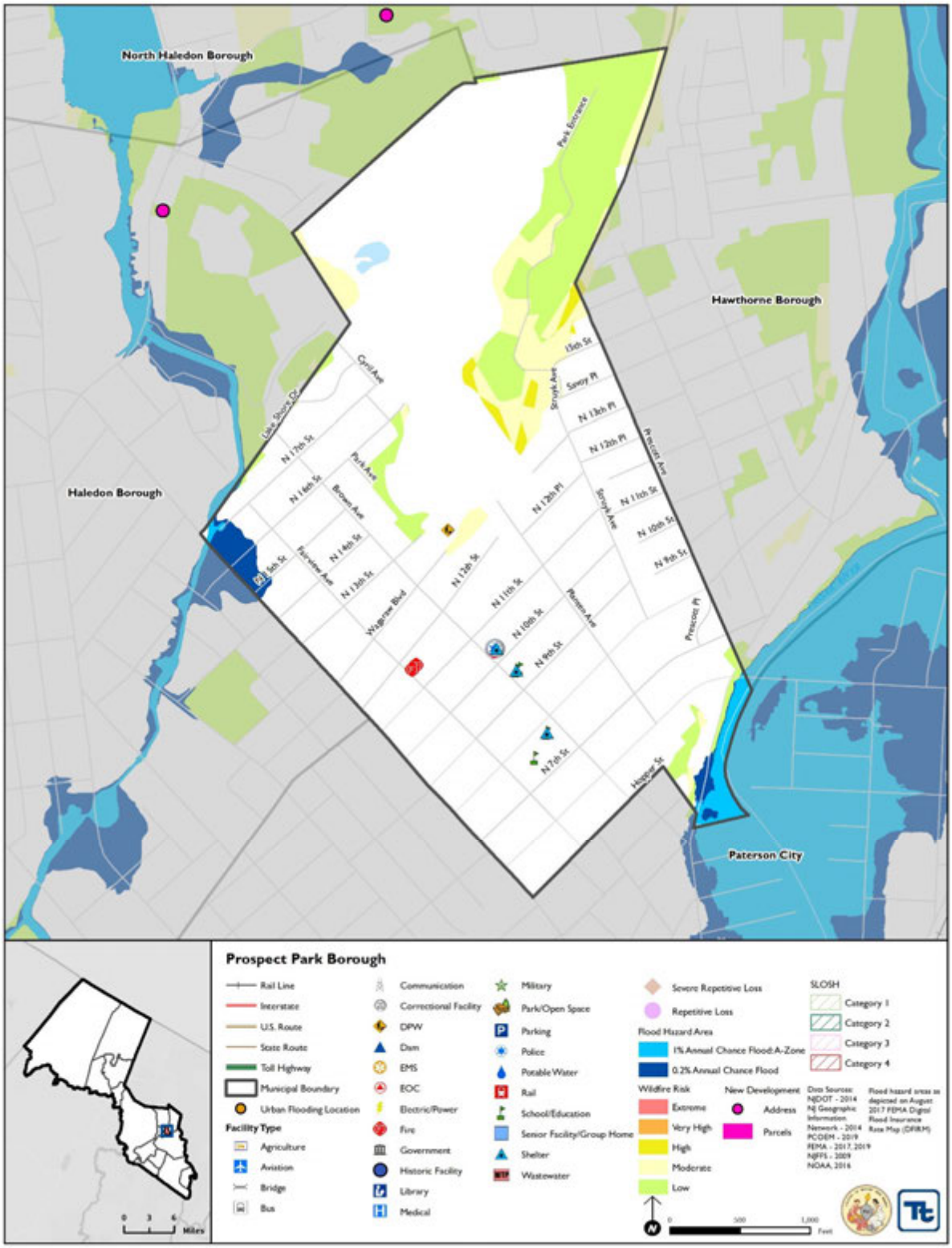
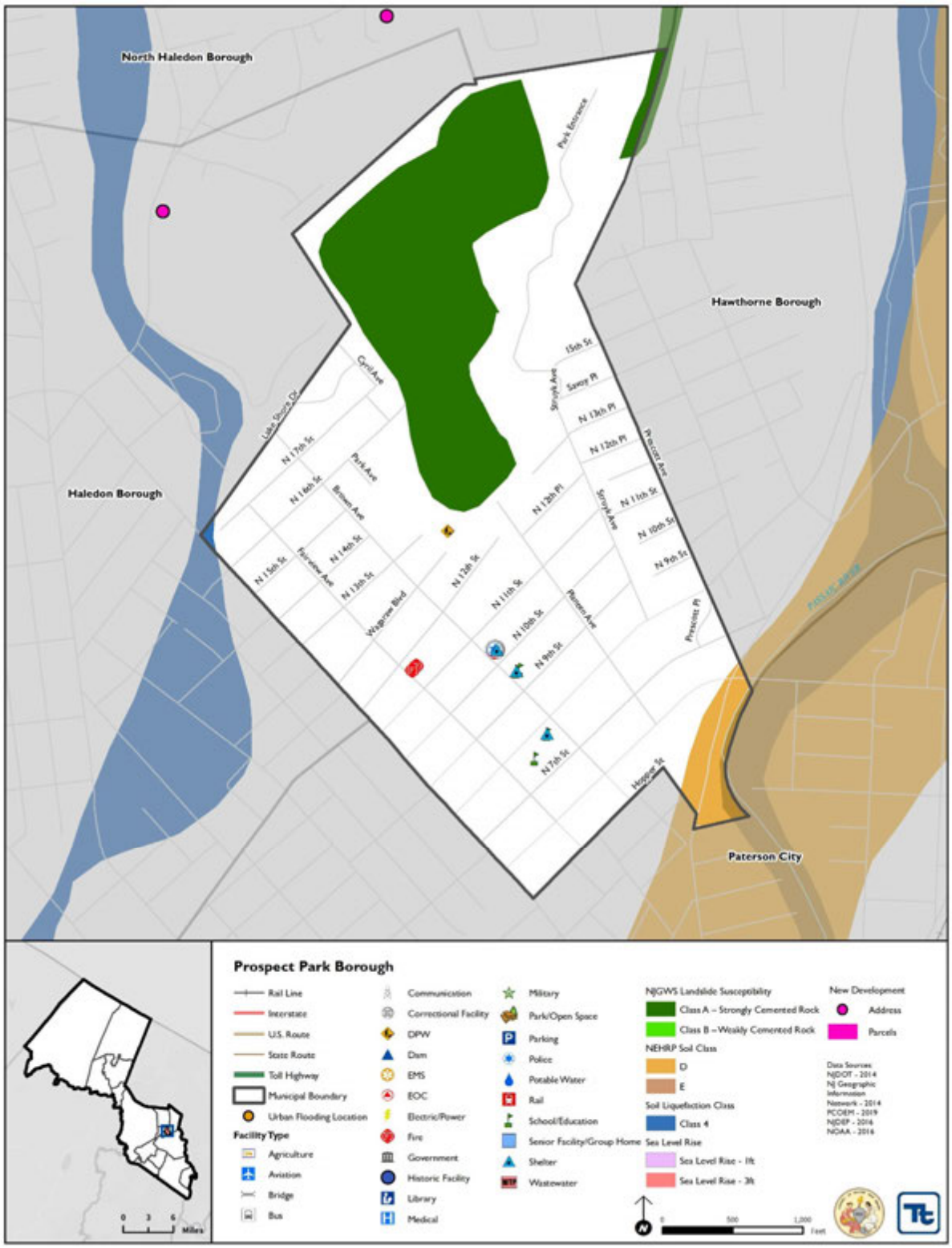


Figure 9.11-2. Borough of Prospect Park Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Backup Generators		
Project Number:	2020-PROSPECT PARK-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	The Borough Hall and Public Works Garage currently do not have backup power. During an outage, they cannot function properly and provide the essential services they provide to residents.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will research the proper size generators that are necessary to supply backup power to the Borough Hall and DPW garage. Once identified, the Borough will purchase and install permanent generators at the Borough Hall, which serves as the EOC, and the public works garage.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations, essential services to the community
Useful Life:	20 years	**Goals Met:**	6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Immediately after funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Borough Administration and Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Generators	
Project Number:	2020-PROSPECT PARK-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services to the Borough.
Property Protection	1	Project will protect the Borough Hall and DPW Garage from power outages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	0	No negative or positive environmental impacts
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Sheltering Plan		
Project Number:	2020-PROSPECT PARK-002		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	The Borough currently does not have a formal shelter plan in place. In the event a shelter is needed, there is no formal plan or procedure to follow.		
Action or Project Intended for Implementation			
Description of the Solution:	Develop a shelter plan to identify proper sheltering for residents considering neighboring communities. The plan will include designating a shelter coordinator, develop an MOU with American Red Cross or Passaic County, identify shelter facilities and ensure agreements are in place, and train staff to maintain shelters.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
(If yes, this project must intend to protect the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Provide steps to opening and running a shelter in the Borough
Useful Life:	N/A	**Goals Met:**	1, 2, 6
Estimated Cost:	$40,000	**Mitigation Action Type:**	LPR
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Immediately after funding received
Estimated Time Required for Project Implementation:	Within 3 years	**Potential Funding Sources:**	FEMA PDM
Responsible Organization:	Borough OEM and Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Update the EOP to include additional shelter information	$10,000+	Not a standalone plan for sheltering; might not be necessary to use when a shelter is opened
	Follow sheltering procedures from County	$0	Not specific to the Borough, no pre-determined list of shelters within the Borough

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Sheltering Plan	
Project Number:	2020-PROSPECT PARK-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides proper sheltering for residents in the event of an emergency
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	
Fiscal	0	Need to secure funding to complete
Environmental	0	No negative or positive environmental impacts
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	To be completed within 3 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

9.12 BOROUGH OF RINGWOOD

This section presents the jurisdictional annex for the Borough of Ringwood. The annex includes a general overview of the Borough; an assessment of the Borough of Ringwood's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.12.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Ringwood's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.12-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Patrick Murray, Jr. / OEM Coordinator Address: Phone Number: 917-731-6958 Email: pmurray@pjmandsons.com	Name / Title: Scott Heck / Borough Manager/Director DPW Address: Phone Number: 973-475-7101 Email: sheck@ringwoodnj.net
NFIP Floodplain Administrator	
Name / Title: Scott Heck / Borough Manager/Director DPW Address: Phone Number: 973-475-7101 Email: sheck@ringwoodnj.net	

9.12.2 Jurisdiction Profile

In the early 1700's, settlers found iron ore, which prompted the construction of the first iron furnace in the area. Iron production was a major industry throughout the community's development, providing ammunition during the Revolutionary War and continuing production throughout the 19th and early 20th century (Borough of Ringwood, 2014). The Borough of Ringwood was incorporated as an independent municipality when Pompton Township was divided into the Boroughs of Bloomingdale, Wanaque and Ringwood in 1918 (Snyder, 1969).

Ringwood is governed by the Council/Manager form of government under the Faulkner Act (Borough of Ringwood, 2014).

According to the U.S. Census Bureau, the Borough has a total land area of 28.2 square miles, of which 25.2 square miles is land and an approximate 3-square miles is water. The Borough is one of five towns that are 100% in the Highlands Preservation Zone. Most of the vacant land in the Borough is limited by wetlands, steep slopes, Category 1 waters, or located within the Highlands Preservation Area. In addition, the Borough zoning ordinance has many protective measures with regard to stormwater runoff and drainage throughout the Borough.

According to the U.S. Census, the 2010 population for the Borough of Ringwood was 12,228. The estimated 2017 population was 12,451, a 2-percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.3 percent of the population is 5 years of age or younger and 16.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.12.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. The Borough is completely located within the New Jersey Highlands which greatly restricts development. The following table summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.12-1 and 9.12-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.12-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	4 new 3 demo	3 new 2 demo	3 new 2 demo	1 new 2 demo	1
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	1 new 1 demo	1 new 1 demo	0 new 1 demo	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None identified					

** Only location-specific hazard zones or vulnerabilities identified.*

9.12.4 Capability Assessment

The Borough of Ringwood performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.12-4). The Borough of Ringwood identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Ringwood.

Table 9.12-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes		
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019. The Borough Building and Housing Code is Chapter 12.*					
Zoning Code	Yes	Local	Yes		
Comment: *State permissive on local level. [note local ordinance # and date of adoption]. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Borough has a Planning Board.*					
Subdivisions	Yes	Local	Yes		
Comment: Planning, Ringwood Zoning Ordinance*P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Borough has a Planning Board. The Borough Land Subdivision code (Chapter 36) provides rules, regulations and standards to guide land subdivision and land use control in the Borough. The flood hazard, wetlands, percent slope need to be included in the subdivision application to be reviewed by the Planning Board.*					
Stormwater Management	Yes	State	Yes		
Comment: *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8.* *The Borough Stormwater Management Regulations are in Chapter 28. The purpose of this chapter is to establish minimum stormwater management requirements and controls for major development (i.e., one acre more acre of land or increasing impervious surface by ¼ acre or more) in the Borough of Ringwood. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in the chapter. To the maximum extent feasible, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.*					
Post-Disaster Recovery	No				
Comment:					
Real Estate Disclosure	No	State			
Comment: *Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local			
Comment: Growth management is addressed in the Zoning Ordinance					
Site Plan Review	Yes	Local			
Comment: *Site plan review is discussed in the Zoning and Subdivision ordinances – see above.* *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by county planning board and for the approval of those subdivisions affecting county road or drainage facilities. 40:27-6.10: Each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map.*					
Environmental Protection	Yes	Borough	Yes		

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Environmental Assessment Ordinance (Environmental Impact Statement) was passed in compliance with the Highlands Act. The Borough is one of five towns that are 100% in the Highlands Preservation Zone. The EIS considers slopes, stream corridors, floodplains, water supply and other hazard areas and environmental resources.*					
Flood Damage Prevention	Yes	Federal, State, Local	Yes		
Comment: *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance.* *The Flood Damage Prevention Ordinance, Chapter 27 of the municipal code, is administered by the Floodplain Administrator (Construction Official or designee). It is the purpose of the ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed. Updated flood ordinance was adopted February 2020.* *a. To protect human life and health;* *b. To minimize expenditure of public money for costly flood control projects;* *c. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* *d. To minimize prolonged business interruptions;* *e. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* *f. To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* *g. To ensure that potential buyers are notified that property is in an area of special flood hazard; and* *h. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					
Wellhead Protection	Yes	Zoning Officer and Engineer	Yes		
Comment: *Delineation of well head protection areas (WHPAs) is part of the NJ-approved 1991 well head protection plan (WHPP) for public community water supply wells. These are priority areas for efforts to prevent and clean up ground water contamination. Municipalities are empowered to regulate land use, physical facilities and other activities within WHPAs areas, the potential for groundwater contamination can be reduced under the provisions of the New Jersey Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., which authorizes each municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents. Also refer to Safe Drinking Water Regulations (NJAC 7:10-11.7(b)1)).* *The Borough's Well Head Protection ordinance is Chapter 39. The groundwater under the Borough is a major source of existing and future water supplies, including drinking water. The Borough of Ringwood is empowered to regulate these activities under the provisions of the New Jersey Municipal Land Use Law, N.J.S.A 40:55D-1 et seq., which authorizes each Municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents.*					
Emergency Management	No				
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. See Emergency Operations Plans below.*					
Climate Change	No				
Comment:					
Disaster Recovery Ordinance	No				
Comment:					
Disaster Reconstruction Ordinance	No				
Comment:					
Other					
Comment: • *Municipal Separate Storm Sewer System (MS4) – Stormwater management plan* • *Tree Protection Ordinance in the zoning ordinance – This ordinance regulates the removal of trees on private property; a permit is needed from the Building Department prior to removal.*					
Planning Documents					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comprehensive / Master Plan	Yes, Reexamination June 2012	Local, Planning	Yes	No	
Comment: The Borough's Master Plan update is on the horizon. The Borough plans to integrate the 2020 HMP into the update; refer to new mitigation action 2020-Ringwood-003. *Per NJSA: Yes, if planning board (40:55D-28) and must be re-examined every ten years (40:55D-89.1); County: Yes (40:27-2),*					
Capital Improvement Plan	Yes	Local Borough Manager			
Comment: In the annual budget *Per NJSA 40:55D-29) the governing body is authorized to direct the planning board to prepare a CIP with at least a six year planning horizon.*					
Disaster Debris Management Plan	In progress				
Comment: *The County is currently leading a countywide debris management plan and the municipalities are identifying staging areas and contributing to the plan.*					
Floodplain or Watershed Plan	No				
Comment:					
Stormwater Management Plan	Yes Revised 3/28/05	State, Engineering			
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).*					
Stormwater Pollution Prevention Plan	Yes, Revised 12/5/19				
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).*					
Urban Water Management Plan	No				
Comment:					
Habitat Conservation Plan	No				
Comment: *May develop a conservation plan element in master plan per NJSA 40:5D-28b (8).*					
Economic Development Plan	In progress				
Comment: *Per NJSA 40:55D-28b. (9) There can be a generic Economic Development Element of the County Comprehensive Plan. Municipality can establish Economic Development Commission that can facilitate incentive programs (façade programs, low-interest loans, etc.) Plan is in progress, being led by the Borough Economic Development Commission.*					
Shoreline Management Plan	NA				
Comment:					
Community Wildfire Protection Plan	No				
Comment: *Optional accreditation for county and municipalities for reduction of liability, New Jersey Urban and Community Forestry Program (NJUCF).*					
Community Forest Management Plan	No				
Comment: *State Park does fire protection of own lands and controlled burns in the Borough.*					
Transportation Plan	Yes				
Comment: *Part of the Master Plan - circulation plan element in master plan per NJSA 40:55D-28b. (4).*					
Agriculture Plan	No				

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *May develop a farmland preservation plan element per NJSA 40:5D-28b (13).*					
Climate Action Plan	No				
Comment: *May develop a green building and environmental sustainability plan element per NJSA 40:5D-28b (16).*					
Tourism Plan	No				
Comment:					
Business Development Plan	No				
Comment: *Economic development commission working on plan*					
Other	Yes				
Comment: • *Open Space Plan, Yes, June 2010, Local* • *Stream Corridor Management Plan* • *Housing Element and Fair Share Plan, Yes, May 10, 2010* • *Natural Resource Inventory, Yes, June 2005*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	State	Yes		
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. One more year until the next update.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No				
Comment:					
Post-Disaster Recovery Plan	No				
Comment:					
Continuity of Operations Plan	No				
Comment: *Refer to EOP*					
Public Health Plan	Yes	Borough Health Department			
Comment: *Refer to EOP; Borough has a Board of Health and Health Officer*					
Other					
Comment:					

Table 9.12-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes – Building department
Does your jurisdiction have the ability to track permits by hazard area?	No

Criterion	Response
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, the Borough has a build-out plan as part of the COHA obligation

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Ringwood.

Table 9.12-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning/Land Use administrator
Mitigation Planning Committee	No	
Environmental Board / Commission	Yes	Meets monthly
Open Space Board / Committee	Yes	Meets quarterly
Economic Development Commission / Committee	Yes	Meets monthly
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911
Maintenance program to reduce risk	Yes	DPW/Engineering – stormwater management, de-snagging, clearing
Mutual aid agreements	Yes	Borough Manager
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering/Borough Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering/Borough Engineer
Planners or engineers with an understanding of natural hazards	Yes	Engineering/Borough Engineer
Staff with training in benefit/cost analysis	Yes	Borough Manager
Staff with training in green infrastructure	No	Consultants for energy audits
Staff with education/knowledge/training in low impact development	Yes	Planning/Land Use administrator
Surveyor	No	
Stormwater engineer	Yes	Brough Engineer
Personnel skilled or trained in GIS applications	Yes	Engineering/Borough Engineer
Local or state water quality professional	No	
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Borough Manager
Watershed planner	No	

Staff/Personnel Resource	Availabl e?	Department/Agency/Position
Environmental specialist	Yes	Health Department
Grant writers	No	
Resilience Officer	No	
Other		

Fiscal Capability

The table below summarizes financial resources available to the Borough of Ringwood.

Table 9.12-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes for capital improvements, water system upgrades, roads
User Fees for Water, Sewer, Gas or Electric Service	Yes, no gas and electric but Borough has water and sewer
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes; NJDOT and Highlands Coalition Grant
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Ringwood.

Table 9.12-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Scott Heck
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes; community preparedness toolkit; FEMA's website; hurricane survival guide for New Jersey; Gypsy Moth bulletin and other resources for residents on emergency preparedness
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, this has been used for Sustainable Jersey efforts Post information regarding cleaning catch basis and storm events
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Police department phone line for road hazards and street closures
Do you have any established warning systems for hazard events?	Reverse 911 and social media

Criterion	Response
• If yes, briefly describe.	

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Ringwood.

Table 9.12-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Class 4 (1 and 2 dwellings) Class 3 for all other construction	
Public Protection (Fire ISO Protection Class)	No		
Storm Ready Certification	No		
Firewise Community Classification	No		
Sustainable New Jersey	Yes	Bronze	Certified December 11, 2018

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	No
Is the administrative supportive of integrating climate change in policies or actions?	No
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	High – have had dams redone
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	High - have geological studies conducted, injected concrete, soil samples
Severe Weather	High

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Severe Winter Weather	High
Wildfire	Medium
Hazardous Materials	Medium
Disease Outbreak	Medium

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.12-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Public works
Who is your floodplain administrator? (name, department/position)	Scott Heck - Borough Manager and Director of Public Works
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	Borough – passed updated in February 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	Unknown
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	Adopted preliminary maps Tuesday (2/18)
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	No
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
˜ If so, what type of assistance/training is needed?	CFM training
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	35 policies (NFIP and WYO) $8,66,600 total coverage (NFIP and WYO)
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	20 losses $87,228 paid
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of July 31, 2019*

WYO = Write Your Own

9.12.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Master Plan Reexamination Report (2012):** Continuing to build off the Master Plan of 1991, the Reexamination Report addresses the opportunities and difficulties with growth and development in the Borough. The original Master Plan identified environmentally critical areas, which include flood hazard zones, steep slopes and poor soils, and discussed restrictions on development in flood zones. Since the adoption of the Master Plan in 1991, the Borough has continued to encourage the preservation of its environmental character and natural resources.
- The **Ringwood Planning Board** performs the duties of a municipal Planning Board as outlined in the Municipal Land Use Law. Responsibilities include preparing, adopting and reexamining the Master Plan; review subdivision and site plan applications, and maintain files on municipal Master Plans and development regulations.
- **Open Space Plan Update (2010):** The Plan aims to protect and preserve the natural resources and environmentally sensitive areas of the Borough. These include the areas wetlands, floodplains, steep slopes and ridgelines, and farmlands. Since the establishment of an open space tax in 2001, the Borough has had great success in acquiring parcels for open space and preservation through a multitude of funding sources in addition to their own tax. Acquisition projects have ranged from 2.5 acres in size up to 160 acres. This plan is consistent with the open space requirements set forth in the Borough's Master Plan, Passaic County Open Space and Recreation Master Plan and the Highlands Regional Master Plan.
- The following mitigation actions have been used or are proposed as a means to achieve the plan's goals:
    - Municipal Open Space, Recreation, Conservation, Farmland and Historical Preservation Trust Fund (OSTF) – Funded by a $0.01 per $100 of assessed property value tax
    - Creation of an Open Space, Conservation, Recreation, Farmland and Historical preservation Advisory Committee (OSC)
    - Open space acquisition
    - Use of trail, scenic, conservation, and historic easements
    - Hold and purchase properties that have gone through tax foreclosure
- **Environmental Commission** protects and improves the quality of the Borough's land, water and air by advising the Borough on actions and policies of sustainability. One of their objectives is to provide guidance to residents on invasive species; a new hazard of concern in the 2020 HMP. Their website ha has information on the gypsy moth.
- **Natural Resource Inventory (NRI) (2005):** The NRI, funded through ANJEC and Highlands Preservation Act grants, is used to identify, quantify and describe the environmental resources and critical habitats of the Borough, which can be used in future land use and preservation policies. Areas identified in the NRI can be suitable locations for open space acquisition. The NRI was adopted as part of the Borough's Conservation Plan Element of the Master Plan in 2006. The Borough intends to

incorporate the 1981 geology section and portions of the data prepared in previous NRI's into an integrated Highlands Borough Environmental Resources Inventory in the future.

- **Stormwater Management Plan (2005):** The Borough's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. For developments that cannot meet stormwater requirements on site, a mitigation project can be proposed or a project may be chosen from the list of projects provided by the Borough.
- **Ordinances:** The Borough has its ordinances and flood protection measurements available on its website. Please visit the Borough of Ringwood website at http://www.ringwoodnj.net/content/3884/default.aspx for further information.
- The Borough is completely located within the New Jersey Highlands which greatly restricts development. Most of the vacant land in the Borough is limited by wetlands, steep slopes, Category 1 waters, or located within the Highlands Preservation Area. In addition, the Borough zoning ordinance has many protective measures with regard to stormwater runoff and drainage throughout the Borough.
- **Outreach:** The Borough's website publishes community news announcements and public notices regarding community events and municipal decisions. Information regarding public health clinics is also posted to site. The Office of Emergency Management provides residents with resources to become better prepared for severe weather events and other emergency situations. These include the Community Preparedness Toolkit and the Hurricane Survival Guide for New Jersey.
- **Funding:** State grants, NJ Green Acres program, Passaic County Open Space grants, the municipal OSTF and the Watershed Preservation Partnership have provided funding for mitigation projects and open space acquisition.
- **Sustainable Jersey:** The Borough is a Sustainable Jersey bronze certified applicant and has implemented several sustainability actions. The following are related to hazard mitigation.
    - **Community Partnership and Outreach –** social media posts announced opportunities to learn more about the program and contribute ideas to help conserve Ringwood while promoting town-wide prosperity. Meetings are held monthly at Borough Hall.
    - **Environmental Commission –** the Borough's Environmental Commission has been at the forefront of environmental activity which includes protecting water resources and monitoring events at the Ringwood Mines Superfund Site.

Opportunities for Future Integration

As this HMP update is implemented, the Borough will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The Borough will be updating their Master Plan in the near future to further guide zoning and land use. The Borough will consult the Hazard Mitigation Plan at the time of the next Master Plan update. Refer to Table 9.12-15, mitigation action 2020-Ringwood-003.

9.12.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Ringwood's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.12-10 provides details regarding municipal-specific loss and damages the Borough of Ringwood experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.12-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	Tree down, causes flooding, drainage issues, power outages
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both directions west of CR 625 and Randolph Ave. due to flooding.	Flooding and drainage issues
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Tree down, power outages

N/A = Not applicable

9.12.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following table summarizes the Borough of Ringwood risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.

- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.12-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	12,451	100-year MRP Hurricane:	4,486	100-year MRP Hurricane:	$426,905	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	0	NEHRP D&E:	0	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$5,112,294	
						2,500-year MRP building damages/loss:	$72,147,147	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,821	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators and HVAC; thermal		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	286			expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	84	1% annual chance	35	1% annual chance	$4,289,281	High
		0.2% annual chance	122	0.2% annual chance	87			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	0	Class A:	71	Class A:	$44,347,993	Moderate
		Class B:	6	Class B:	3	Class B:	$1,266,132	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	58	Number of buildings the hazard area:	27	Replacement cost value of buildings located in the hazard area:	$23,845,193	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Ringwood.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.12-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
James Drive Sewer Treatment Plant	Wastewater	X		New generator installed, no further mitigation needed
Water Buffering Tank	Potable Water		X	Backup power in place
Well and Pump Station – Skyline Lakes Drive & Meadow Lane	Potable		X	Backup power in place
Pump Station – Skyline Lakes Drive	Potable		X	Backup power in place

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- According to the 2007 Flood Insurance Study (FIS) for Passaic County, the Borough of Ringwood experiences flooding from Ringwood Creek, Cupsaw Brook and West Brook. Flooding from the Wanaque River also affects the Borough (FEMA FIS 2007).
- Library Canicci Drive - the basement gets flooded; Borough-owned facility; there are pumps in the basement and there is a generator but still impacted and Borough incurs losses
- Due to the presence of iron ore mines, sinkholes have occurred in the past in the northern section of the Borough.
- Large amount of open space with Emerald Ash Borer in the State Park; trees down is a huge issue, blocks roads, stops stormwater drainage

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Ringwood that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Ringwood has significant exposure; refer to Figures 9.12-1 and 9.12-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Ringwood. The Borough of Ringwood has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough indicated the following:

- Earthquake was calculated as low but moved back to a medium same as 2015 because located on the Ramapo Fault
- Coastal storm moved to medium, high impact events are not frequent

Table 9.12-13. Borough of Ringwood Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Medium	Medium	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Medium	Medium	Medium	Medium

9.12.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.12-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Ensure continuity of operations at critical facilities. The following have	Borough of Ringwood	Completed for a portion of this action	Include the installation of	2020-Ringwood-004

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
been identified to date: 1. Generator and Electrical Works for MJ Ryerson School/shelter 2. Generator for DPW and Erksine Fire House 3. Backup power for Peter Cooper School/shelter		Generator installed at DPW and Erksine Fire House	generators for MJ Ryerson School/Shelter and Peter Cooper School/shelter	
Retrofit the Police Department/data storage facility/Municipal Building located on Margaret King Avenue with impact resistant shutters to windows and doors.	Borough of Ringwood	No longer a priority and discontinue		
Flood proof utilities in Municipal Building/Police Department located on Margaret King Avenue	Borough of Ringwood	In progress	Include in the 2020 HMP; complete building improvements funded by the Borough	2020-Ringwood-005
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	Borough would work with property owners to mitigate and identify funding sources; new ordinance requires this assistance	Yes	2020-Ringwood-006
The Borough will consult the HMP during the next Master Plan update	Borough of Ringwood	No progress	Include in the HMP	2020-Ringwood-003
Upgrade and improve storm-water culverts along Magee Road	Borough Engineer	No progress	Include in the HMP but note this needs to be led by the County.	2020-Ringwood-001

In addition to the above progress, the Borough of Ringwood identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- State has a program – Lake Restoration and Dam Program and all high-hazard dams have been rebuilt in the last 15 years, reinforced structures in accordance with regulations – Borough co-signed loans with private owners of lakes.
- Applied for grant funding with the Highlands to form a public-private partnership to test water quality in privately-owned lakes to monitor for harmful algal blooms

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Ringwood participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Ringwood participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.12-15 summarizes the comprehensive range of specific mitigation initiatives the Borough of Ringwood would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.12-15. Proposed Hazard Mitigation Initiatives and Associated Priority

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Ringwood-001	Magee Road Stormwater Mitigation Project	**Problem:** Existing culvert is undersized causing flood closures of Magee Road which is a single access/egress to the adjacent development of approximately 100 homes.	**Solution:** Increase culvert capacity and raise banks and roadway.	Existing	Flood	1, 2	Borough Manager	FEMA, Borough for match	High	High	Short	High	SIP	PP
2020-Ringwood-002	Lake Testing	**Problem:** There is no lake testing program to assist with the identification of environmental concerns including harmful algal blooms.	**Solution:** Develop a public private partnership with the Highlands for all lakes, testing inflows into the lake and the lakes to determine phosphorus and nitrogen loading.	N/A	Infestation and Invasive Species		Borough Manager	Highlands Coalition	High	Medium	Short	High	NSP	NR
2020-Ringwood-003	Integrate HMP into Master Plan Update	**Problem:** The Master Plan will be updated in the near future and could further align with the Hazard Mitigation Plan.	**Solution:** When updating the Master Plan, review and align with the Hazard Mitigation Plan to ensure future land use plan take into account high-hazard areas.	Both	Coastal Storm, Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Infestation and Invasive Species, Severe Weather, Severe Winter Weather, Wildfire	4, 5	Planning Board	Borough	High	Low	Short	High	LPR	PR
		Problem: Critical facilities, such as the MJ Ryerson School/Shelter and Peter		Existing	Coastal Storm,	1, 6	Emergency Manager	FEMA HMA	High	High	Short	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem / Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Ringwood-004	Shelter Continuity Project	Cooper School/shelter, do not have permanent generators installed and their continuity of operation is needed during hazard events. Further, they require a dedicated water supply to ensure continuity of operations but do not have this installed at Peter Cooper, Erskine, Hewitt and MJ Ryerson schools which are designated shelters. **Solution:** Install permanent generators at critical facility locations in the Borough, including MJ Ryerson School/Shelter and Peter Cooper School/shelter. Extend water system service to Peter Cooper, Erskine, Hewitt and MJ Ryerson schools which are designated shelters.		Dam Failure, Disease Outbreak, Drought, Earthquake, Extreme Temperature, Flood, Geological Hazard, Hazardous Substances, Infestation and Invasive Species, Severe Weather, Severe Winter Weather, Wildfire									
2020-Ringwood-005	Floodproof Critical Facilities and Lifelines	**Problem:** The municipal building and Police Department located on Margaret King Avenue are vulnerable to flooding. **Solution:** Flood proof utilities in Municipal Building/Police Department located on Margaret King Avenue	Existing	Flood, Severe Storm	2, 6	NFIP Floodplain Administrator; Borough Manager	FEMA HMA	High	High	Short	High	SIP	PP
2020-Ringwood-006	Mitigate flood-prone properties	**Problem:** Flood events have resulted in damages to property in the Borough. **Solution:** Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone area that experience frequent flooding (high risk areas).	Existing	Flood, Severe Weather	1, 2	NFIP Floodplain Administrator; Borough Manager	FEMA HMA	High	High	Short	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem / Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Ringwood-007	Tracking geological hazard events	**Problem:** Due to the presence of iron ore mines, sinkholes have occurred in the past in the northern section of the Borough. However, the Borough does not track these events and impacts. **Solution:** Develop an internal tracking system to document sinkhole events and associated impacts. Work with property owners to identify appropriate mitigation actions.	Existing	Geologic	4, 5	Emergency Manager, Borough Manager	Borough	High	Low	Short	Medium	LPR	PR
2020-Ringwood-008	Mitigate Library	**Problem:** Library Canicci Drive - the basement gets flooded; Borough-owned facility; there are pumps in the basement and there is a generator but still impacted and Borough incurs losses **Solution:** Conduct a feasibility study to identify mitigation alternatives to reduce flood impacts to the Library. Identify the most feasible action, apply for funding and implement the action.	Existing	Flood, Severe Storm	2	Emergency Manager, Borough Manager	Borough	High	High	Short	Medium	SIP	PP
2020-Ringwood-009	Increase Drainage Capacity	**Problem:** Insufficient drainage capacity at locations throughout the Borough that causes localized flooding. **Solution:** Increase the capacity of the drainage in the Borough including at the following locations identified in the capital plan for improvements: • Edgewood Road/Sylvan Lane Drainage • High Mountain Road/Seneca Drive Drainage, Phase 1 • High Mountain Road, Phase 2. • Skyline Lake Drive (near #81) • E. Brook sure Avenue (near 108)	Existing	Flood, Severe Storm	1, 2	Engineer	Capital Improvement Budget	High	High	Short	High	SIP	PP

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:

N/A	*Not applicable*	*A description of the estimated benefits, either quantitative and/or qualitative.*
NFIP	*National Flood Insurance Program*	
OEM	*Office of Emergency Management*	

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.12-16. Summary of Evaluation and Action Priority

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Ringwood-001	Magee Road Stormwater Mitigation Project	1	1	1	1	1	1	0	0	0	0	1	1	1	1	10	High
2020-Ringwood-002	Lake Testing	1	0	1	1	1	1	1	0	0	0	0	1	1	1	9	High
2020-Ringwood-003	Integrate HMP into Master Plan Update	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Ringwood-004	Shelter Continuity	1	1	1	1	1	1	0	0	0	0	1	1	1	1	10	High
2020-Ringwood-005	Floodproof Critical Facilities and Lifelines	1	1	1	1	1	1	0	0	0	0	1	1	1	1	10	High
2020-Ringwood-006	Mitigate flood-prone properties	1	1	1	1	1	1	0	0	0	0	1	1	1	1	10	High
2020-Ringwood-007	Tracking geological hazard events	0	0	1	1	1	1	1	1	0	1	0	0	0	0	7	Medium
2020-Ringwood-008	Mitigate Library	0	1	1	1	1	1	0	0	0	0	1	1	1	1	9	Medium
2020-Ringwood-009	Increase Drainage Capacity	1	1	1	1	1	1	1	0	0	1	1	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).

Table 9.12-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	-003	-001, -006			-004, 005	-006, -008, -009		
Dam Failure	-003				-004, 005			
Disease Outbreak	-003			-002	-004, 005			
Drought	-003				-004, 005			
Earthquake	-003				-004, 005			
Extreme Temperature	-003				-004, 005			
Flood	-003	-001, -006			-004, 005	-006, -008, -009		
Geological Hazards	-003				-004, 005			-007
Hazardous Substances	-003				-004, 005			
Infestation and Invasive Species	-003							
Severe Weather	-003	-001, -006			-004, 005	-006, -008, -009		
Severe Winter Weather	-003				-004, 005			
Wildfire	-003				-004, 005			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.12.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Ringwood followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.12-18. Contributors to the Annex

Name	Title	Method of Participation
Scott Heck	Borough Manager/DPW	Secondary point of contact; attended meetings; contributed to the annex update
Patrick Murray	OEM Coordinator	Primary point of contact; attended meetings; contributed to the annex
Helen Forsa	Land Use Administrator	Contributed information to the capability assessment
Jeff Yuhas	Engineer	Contributed to the annex (capability assessment and mitigation strategy)
Sal Poli	Construction Official and NFIP Floodplain Administrator (FPA)	NFIP FPA; reviewed annex
Nicole Langemayr	Borough Clerk	Reviewed the annex

Name	Title	Method of Participation
Debbie Buchanan	CFO	Reviewed the annex
Linda Schaefer	Mayor	Reviewed the annex
Don Devlin	Fire Official	Reviewed the annex
Joseph Walker	Chief of Police	Reviewed the annex

Figure 9.12-1. Borough of Ringwood Hazard Area Extent and Location Map 1

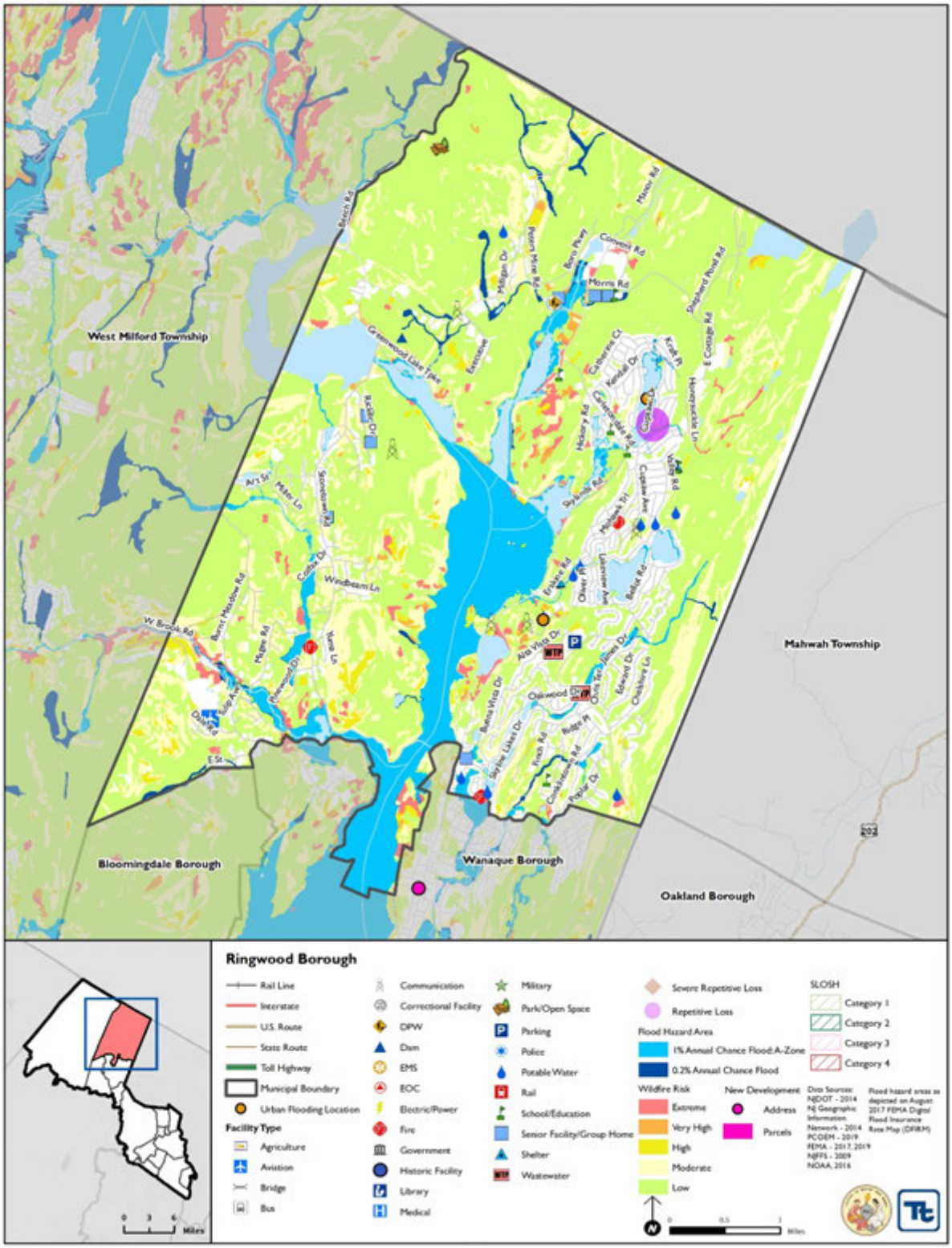
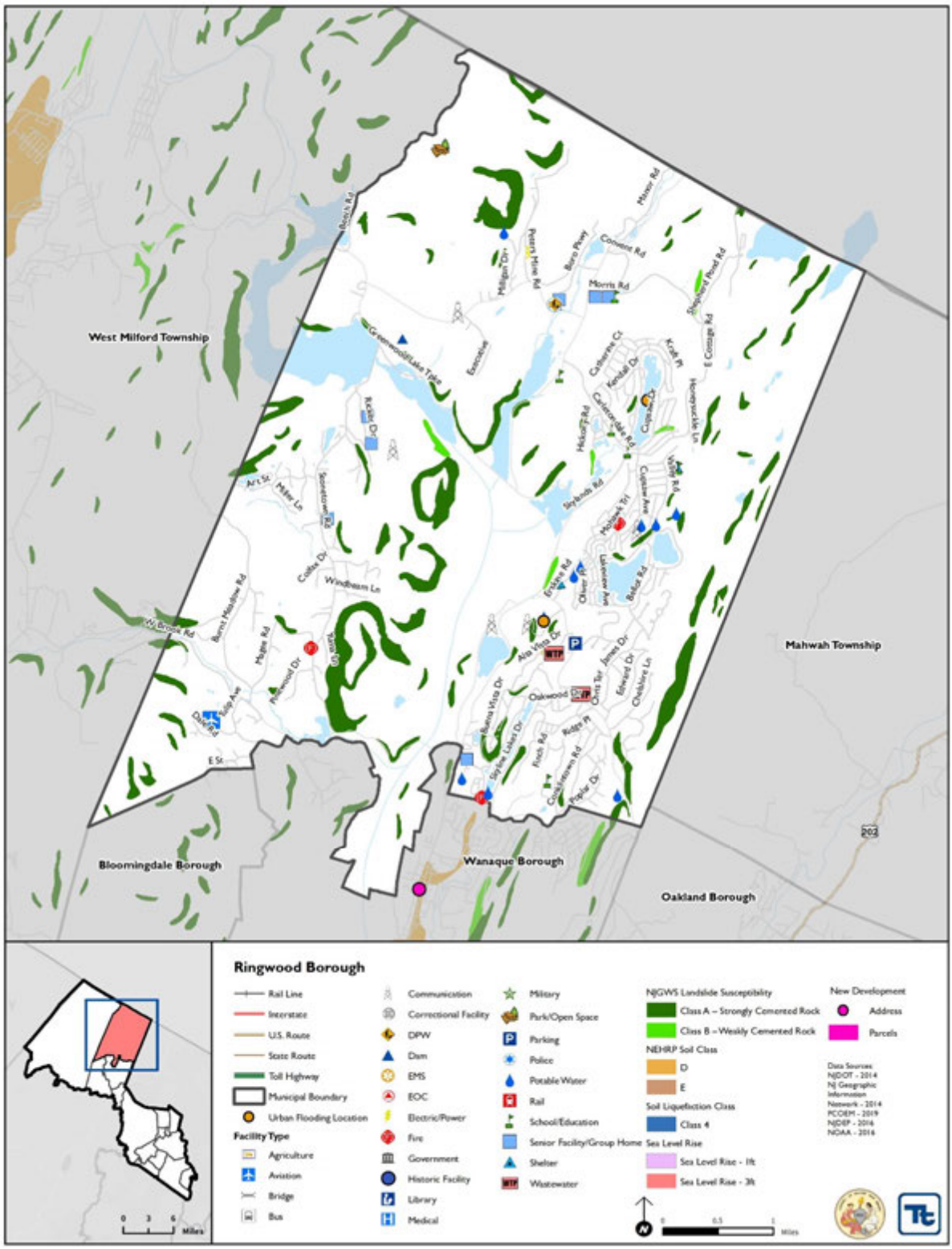


Figure 9.12-2. Borough of Ringwood Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Shelter Continuity Project		
Project Number:	2020-Ringwood-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather. Coastal Storms, Winter Weather		
Description of the Problem:	During hazard events these lifeline/shelter facilities require a dedicated water supply to ensure continuity and availability. Critical facilities, such as the MJ Ryerson School/Shelter and Peter Cooper School/shelter, do not have permanent generators installed and their continuity of operation is needed during hazard events.		
Action or Project Intended for Implementation			
Description of the Solution:	Extend town water system to service the Peter Cooper, Erskine, Hewitt, and MJ Ryersen schools which are designated shelters. Install permanent generators at MJ Ryerson School/Shelter and Peter Cooper School/shelter.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; continued assistance to residents during/post-disaster events
Useful Life:		**Goals Met:**	1
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	FEMA HMA
Responsible Organization:	Town Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Generators		Install permanent generators and extend water services
	Alternate Shelters		Identify alternate shelter locations within or outside of the Borough

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Shelter Continuity Project	
Project Number:	2020-Ringwood-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	0	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	0	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Borough of Ringwood-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Flooding events have resulted in damages to properties in the Borough, including two repetitive loss properties.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$10 Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Depends on funding
Estimated Time Required for Project Implementation:	Short, depends on funding and interest of property owners	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Acquire or elevate homes	>$100,000	Elevating homes would not eliminate the problem and still lead to road closures and impassable roads; Acquisition would eliminate future impacts however both actions depend on agreement with property owners
	Elevate roads	>$100,000	Elevated roadways would not protect properties from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020- Borough of Ringwood -006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	
Fiscal	0	Project will require grant funding
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.13 BOROUGH OF TOTOWA

This section presents the jurisdictional annex for the Borough of Totowa. The annex includes a general overview of the Borough; an assessment of the Borough of Totowa's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.13.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Totowa's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.13-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Rich Schopperth, Fire Official 537 Totowa Road, Totowa, NJ 07512 (973) 956-1000 ext. 1013 rschopperth@totowanj.org	Joseph Wassel, Municipal Clerk 537 Totowa Road, Totowa, NJ 07512 973-956-1000 ext. 1004 jwassel@totowanj.org
NFIP Floodplain Administrator	
Allan Burghardt, Construction Official 537 Totowa Road, Totowa, NJ 07512 973-956-1000 ext. 1006 aburghardt@totowanj.org	

9.13.2 Jurisdiction Profile

The Borough was first settled around 1750, but it was not until 1898 that it became an incorporated municipality in New Jersey (Borough of Totowa 2019). Today, the Borough is governed by a mayor and six person council.

According to the U.S. Census Bureau, the Borough has a total land area of 4.065 square miles, of which 3.994 square miles is land and 0.071 square miles is water. The Borough is located in southeastern Passaic County. It is bordered to the north and west by Wayne, to the south by Little Falls, and to the east by Paterson and Woodland Park.

According to the U.S. Census, the 2010 population for the Borough of Totowa was 10,804. The estimated 2017 population was 10,829, a 0.2 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.1 percent of the population is 5 years of age or younger and 19 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.13.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.13-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.13-1 and Figure 9.13-2 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development.

Table 9.13-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	4	5	8	2	3
Multi-Family	0	28	0	30	48
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Hilltop Apartments	residential	32 units	75 Lackawanna Ave.		Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Assisted living facility, medical office building, and data center	residential and commercial	4 structures	169 Minisink Road	none	In development
Sunset Ridge	Residential	44 units	617 Preakness Ave	none	In progress
Manor at Totowa	Res	120 units	100 Shepherds Lane	none	In progress
The View Banquet Hall	Commercial	1 building	555 Preakness Ln	none	In progress

** Only location-specific hazard zones or vulnerabilities identified.*

9.13.4 Capability Assessment

The Borough of Totowa performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in the Capability Assessment below. The Borough of Totowa identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Totowa.

Table 9.13-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local Construction	Yes	-	-
Comment: *Chapter 153 - Uniform Construction Codes; Building Department enforces*					
Zoning Code	Yes	State & Local Planning Board	Yes	Yes	See comment
Comment: *Chapter 415 - Zoning and Land Use, adopted 6/13/1995; the purpose of this chapter shall be to provide rules, regulations and standards to guide land development in the Borough of Totowa in order to promote the public health, safety and general welfare of the municipality. The Borough might require conservation easements along drainage and stormwater rights-of-way. This type of easement must contain provisions to restrict the removal of trees and ground cover except for the following purposes: removal of dead or diseased trees; thinning of trees and other growth to encourage a more desirable growth; removal of trees to allow for structures designed to impound water; removal of trees in areas to be flooded for the creation of ponds or lakes; and to prohibit filling or grading of the lands or the disposal of refuse or waste material of any type within the limits of the easement. The Zoning and Land Use Code prevent detention basins in the floodway and requires that all development in the floodplain be in compliance with N.J.S.A. 58:16A-50 et seq. Lastly, the Borough has the zoning map posted online; however, it does not show hazards areas (e.g. floodplains). During the next update of this map, the Borough should incorporate hazard areas (e.g. floodplain, steep slope)*					
Subdivisions	Yes	Local	Yes	-	-
Comment: 415-64; NJ 46:23-9.9; *Part of Chapter 415 (Zoning and Land Use) – prior to subdividing or re-subdividing land in the Borough, the Borough requires an application be filed which needs to be approved by the Planning Board.*					
Stormwater Management	Yes	Local - Engineer	Yes	Yes	-
Comment: • *Chapter 349 - Storm Sewers – last amended on 7/27/2010 – prohibits illicit connections and improper disposal of waste.* • *Chapter 352 - Stormwater Control - adopted by the mayor and council on 10/9/2007 – the purpose of this chapter is to establish minimum stormwater management requirements and controls for major development. It states that flood control, groundwater recharge, and pollutant reduction through non-structural or low-impact techniques should be looked at first before structural BMPs. The Borough assures that all new residential development and redevelopment projects that are subject to the Residential Site Improvement Standards for stormwater management are in compliance with those standards.* • *Chapter 320 – Sewers – last amended on 4/8/2008 - It shall be unlawful for any person, firm, company, association, society, corporation or group to place, deposit or permit to be deposited in an unsanitary manner, upon public or private property within the Borough of Totowa, or in any area under the jurisdiction of said Borough of Totowa, any human or animal excrement, garbage, industrial wastes or other objectionable waste. It shall be unlawful to discharge any sewage or waste materials into any natural outlet or watercourse within the Borough of Totowa.*					
Post-Disaster Recovery	Yes	Federal	-	-	-
Comment:					
Real Estate Disclosure	Yes	Local	Yes	Yes	-
Comment: The Borough requires that if you are in the floodplain, you are required to have an elevation certificate at the time of purchase.					
Growth Management	No	-	-	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	-	-
Comment: *Part of Chapter 415 (Zoning and Land Use) – Planning Board responsible for enforcing*					
Environmental Protection	Yes	Local	No	-	-
Comment: • *Chapter 279 - Parks and Recreation Areas – adopted 11/15/1994 – provides regulations for the control of public parks, playgrounds, and pools in the Borough.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
• *Chapter 383 – Trees – adopted by the Borough on 3/22/2005 – controls and regulates indiscriminate and excessive removal, cutting and destruction of trees and to control, regulate and prevent conditions which cause increased surface drainage, sedimentation and soil erosion, cause decreased soil fertility and impair the stability and value of real estate, all of which conditions are and will in the future be a deterrent to public safety, health and welfare.*					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
Comment: *Chapter 189 - Flood Damage Prevention - adopted by the mayor and council on 9/11/2007, designates the Construction Code Official as the local administrator. The code lists methods and provisions to reduce flood costs including: restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards; requiring that uses vulnerable to floods including facilities which serve such uses, be protected against flood damage at the time of initial construction; controlling the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel floodwaters; controlling filling, grading, dredging and other development which may increase flood damage; and preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas. The code requires that all residential and non-residential new construction or substantial improvements have their lowest first floor elevated to or above the base flood elevation.*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	Yes	Local	-	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	See comments
Comment: *2016 Master Plan Re-Examination and Amendment; adopted by the Planning Board on April 14, 2016. This reexamination of the Borough of Totowa Master Plan conforms to the requirements of the Municipal Land Use Law and addresses the requirements of N.J.S.A. 40:55D-89. The plan discussed areas of flooding; however, the plan does not reference the current HMP or other hazard areas of concern. During the next re-examination or update of the master plan, the Borough should consider incorporating the Passaic County HMP. By doing so, it promotes consistency within and between the plans and promotes mitigation as a policy priority across multiple elements.*					
Capital Improvement Plan	Yes	Local	Yes	-	-
Comment:					
Disaster Debris Management Plan	Yes	Local	No	Yes	-
Comment: *The Borough has approval from NJDEP and the EPA to use the DPW yard on Furler Street and the municipal pool property on Colonial Ct. for staging areas for debris removal.*					
Floodplain or Watershed Plan	Yes	Local	Yes	-	-
Comment:					
Stormwater Management Plan	Yes Revised Dec. 2006	Local Engineering	Yes	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities. Several goals of the plan relate to reducing flood damage and protecting life and property, which coincide with the County HMP's goals. A chapter of the plan is dedicated to flood damage control and provides suggestions for incorporating flood damage reduction.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	-	-
Comment: *The plan was updated on 1/17/2014 and outlies the various stormwater management practices the Borough is currently conducting.*					
Urban Water Management Plan	No	-	-	-	-
Comment:					
Habitat Conservation Plan	No	-	-	-	-
Comment:					
Economic Development Plan	No	-	-	-	-
Comment:					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	No	-	-	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	-	-
Comment: OEM					
Agriculture Plan	No	-	-	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	-	-
Comment: The Office of Emergency Management is responsible for maintaining and update the EOP.					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	-	-
Comment: OEM; part of the Borough's EOP					
Continuity of Operations Plan	No	-	-	-	-
Comment:					
Public Health Plan	Yes	Local and County	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					

Table 9.13-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes - Building Dept
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes - very few areas available for development

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Totowa.

Table 9.13-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	The Planning Board has the authority to: • Prepare, adopt and, from time to time, amend or revise a Master Plan. • Exercise control over the review of subdivisions and site plans in accordance with Part 3, Subdivision and Site Plan Review, of this chapter. • Exercise control over the granting of applications for conditional uses. • Whenever the proposed development requires approval of a subdivision, site plan or conditional use (but not a variance pursuant to N.J.S.A. 40:55D-70d),

Staff/Personnel Resource	Available?	Department/Agency/Position
		grant to the same extent and subject to the same restrictions as the Board of Adjustment: o Variances pursuant to N.J.S.A. 40:55D-70c. o Direction pursuant to N.J.S.A. 40:55D-34 for issuance of a permit for a building or structure in the bed of a mapped street or public drainageway, flood control basin or public area reserved on an Official Map. o Direction pursuant to N.J.S.A. 40:55D-36 for issuance of a permit for a building or structure not related to a street. • Exercise such other duties as may be assigned to it by ordinance or resolution of the governing body and perform such other functions as may be authorized by N.J.S.A. 40:55D-1 et seq. and other state statutes and administrative regulations.
Mitigation Planning Committee	Yes	OEM Director
Environmental Board / Commission	Yes	Planning Board
Open Space Board / Committee	Yes	Planning Board
Economic Development Commission / Committee	Yes	Planning Board
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	CodeRED and Register Ready – CodeRED allows residents and businesses of the Borough to add/update their contact information to ensure they are included when a message is sent by the Borough in the event of emergency situations or critical community alerts. Register Ready is New Jersey's special needs registry and allows residents with disabilities or access and functional needs and their families to provide information to emergency response agencies so emergency responders can better plan to serve them in a disaster or other emergency.
Maintenance program to reduce risk	Yes	Administrator, Municipal Clerk; Joint Insurance Fund Safety Officer
Mutual aid agreements	Yes	OEM Director; Mutual aid agreements include storm water management maintenance ordinance
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Construction Official
Planners or engineers with an understanding of natural hazards	Yes	Engineer
Staff with training in benefit/cost analysis	Yes	Administrator, Municipal Clerk
Staff with training in green infrastructure	Yes	Consultants - Planner and Engineer
Staff with education/knowledge/training in low impact development	Yes	Consultants - Planner and Engineer
Surveyor	Yes	Engineer
Stormwater engineer	Yes	Engineer
Personnel skilled or trained in GIS applications	No	
Local or state water quality professional	Yes	DPW - licensed water operator
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	OEM Director and Contractor
Watershed planner	Yes	Engineering

Staff/Personnel Resource	Available?	Department/Agency/Position
Environmental specialist	Yes	Engineering
Grant writers	Yes	OEM Director
Resilience Officer	Yes	The Borough has a flood board made up of the mayor, council, residents, and DPW
Other	No	

Fiscal Capability

The table below summarizes financial resources available to the Borough of Totowa.

Table 9.13-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – CDBG-DR is being used to acquire five homes (approximately $1.3 Billion)
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Totowa.

Table 9.13-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes - The Borough has a link to view the Passaic River flood levels. The Borough's website also has news and events posted.
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes - Flood Board (municipal and resident board) and CERT. • The CERT Program educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members

Criterion	Response
	also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community. • P.V. Regional Flood Control Board - the Board is charged with the overall management of the surface water of the Passaic River and the Peckman River Basins. To do so, its members review potential acquisition, construction, financing, improvement, maintenance and operation of flood control facilities and make recommendations to the governing bodies of Little Falls Woodland Park and Totowa, along with other officials.
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes - tax bills and water bills
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - CodeRED and Register Ready

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Totowa.

Table 9.13-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	3	2013
Public Protection (Fire ISO Protection Class)	Yes	4	2013
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

ADAPTIVE CAPACITY

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes
Is the administrative supportive of integrating climate change in policies or actions?	No
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	Not at this time

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storm	Low
Dam Failure	Low
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	Medium

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.13-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Dept
Who is your floodplain administrator? (name, department/position)	Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	November 14, 2007; amended on February 5, 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Overall, meets the minimum; however, it does not meet the minimum state requirement for new development and substantial improvements in the floodplain which requires a minimum of one foot above the base flood elevation. Refer to 2020-TOTOWA-002
When was the most recent Community Assistance Visit or Community Assistance Contact?	April 2, 1991
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? • If so, what type of assistance/training is needed?	Yes - Ongoing training and education is always welcomed
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No, the Borough does not participate in the CRS program.
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	229 $59,909,100 $46,096
How many total loss claims have been filed in your jurisdiction?*	494

Criterion	Response
• How many claims are still open or were closed without payment? • What were the total payments for losses?	67 closed without payment $6,498,704 total payments
Do you maintain a list of properties that have been damaged by flooding?	Yes – the Borough maintains a list of properties that have been damaged by flooding
Do you maintain a list of property owners interested in flood mitigation?	Yes during outreach

**According to FEMA statistics as of September 30, 2018*

9.13.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Master Plan (Rev. 2013):** This Plan seeks to encourage an orderly distribution of land uses that can provide for the health, safety and welfare of the Borough's residents. Totowa is mostly developed with limited access to properties for open space and active recreation. Many of the Plan's goals aim to focus on redevelopment and revitalization of existing properties and areas, while maintaining and improving their existing open spaces and acquiring other suitable lands for open space.
- **Stormwater Management Plan (2006):** The Borough's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. The Plan contains a section on Flood Damage Control, which provides proposed structural and nonstructural methods of stormwater management, which include:
  - Channel modification
  - Stormwater Detention
  - Floodplain Management and Regulation
  - Disaster Preparedness
- **Ordinances:** The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of Totowa website at http://www.totowanj.org/index.html for further information.
- Prior to land use, zoning changes or development permitting the Borough reviews the hazard mitigation plan or other hazard analyses to ensure consistent and compatible land use.
- The Borough requires that if you are in the floodplain, you are required to have an elevation certificate at the time of purchase. The Building Department saves the elevation certificates.
- The Borough has adopted the League of Municipalities definition of a family and has the family ordinance.
- **Outreach:** The Borough's website has a webpage dedicated to news, where it posts information regarding current events, public health advisories, infrastructure maintenance projects, and general

advisories. The site also has a webpage for the Office of Emergency Management (http://www.totowanj.org/OEM.html), which posts safety tips and links to other emergency related organizations, including FEMA and NFIP. There is also a link to view the current flood levels of the Passaic River. Sheltering information is also available on the website. Residents that require special assistance can register with the Borough on the Register Ready list. The health department visits these houses and provides assistance. For example, during Hurricane Sandy, these residents were checked on individually to see if additional assistance was required.

- **Stormwater Management Outreach:** The Borough has implemented a local public education program that focuses on providing the public with information on stormwater. This includes organizing a stormwater-related poster contest, conducting a stormwater training program for elected officials, distributing a copy of a department's educational brochures, and entering a partnership with community groups to carry out watershed stewardship and educational activities.

- There are three emergency alert systems that residents can sign-up for, Nixle, NJ Alert and NJ Register Ready, which is focused on residents with access and functional needs and their families. Reverse 911 has already been completed.
- **Funding:** The Borough is currently in the process of acquiring five properties using CDBG-DR funding. The Borough has also applied for and obtained funding through FEMA fire grants and FEMA HMGP funding. The Borough also has a line item for mitigation in their capital improvements budget and have funded mitigation projects in the past.
- **Joining CRS:** The Borough is in the process of joining CRS. They have submitted a letter from the Mayor and held a meeting with FEMA Region 2 Headquarters in attendance.
- **Zoning Board of Adjustment:** The Borough has a Zoning Board of Adjustment who has the power to:
  - Hear and decide appeals where it is alleged by the appellant that there is error in any order, requirement, decision or refusal made by an administrative officer based on or made in the enforcement of the zoning regulations.
  - Hear and decide, in accordance with the provisions of the zoning regulations, requests for interpretation of the Zoning Map or zoning regulation or for decisions upon other special questions upon which such Board is authorized to pass by any zoning regulation or Official Map in accordance with this chapter.
  - Variance from application of zoning provisions.
    - Grant, by majority vote, a variance from the strict application of the zoning provisions of this chapter:
      - Where, by reason of exceptional narrowness, shallowness or shape of a specific piece of property, or by reason of exceptional topographic conditions or physical features uniquely affecting a specific piece of property, or by reason of an extraordinary and exceptional situation uniquely affecting a specific piece of property or the structures lawfully existing thereon, the strict application of any regulation in the zoning provisions of this chapter would result in peculiar and exceptional practical difficulties to or exceptional and undue hardship upon the developer of such property.
      - Where, in an application or appeal relating to a specific piece of property, the purposes of the Municipal Land Use Law would be advanced by a deviation from the zoning provisions of this chapter and the benefits of the deviation would substantially outweigh any detriment.

- No variance under this Subsection A(3) shall be granted, however, from those departures enumerated in Subsection A(4), just below. If the proposed development requires a subdivision, site plan or conditional use approval by the Planning Board but not a variance pursuant to N.J.S.A. 40:55D-70d, the request for a variance under these circumstances shall be acted upon by the Planning Board.

- In particular cases and for special reasons, grant a variance to allow departure from the zoning regulations of this chapter to permit a use or principal structure in a district restricted against such use or principal structure; an expansion of a nonconforming use; a deviation from a specification or standard (pursuant to N.J.S.A. 40:55D-67) pertaining solely to a conditional use; an increase in a permitted floor area ratio (as defined in N.J.S.A. 40:55D-4); an increase in a permitted density (as defined in N.J.S.A. 40:55D-4), except as applied to the required lot area for a lot or lots for detached one- or two-dwelling-unit buildings which lot or lots are either isolated undersized lots or lots resulting from a minor subdivision; or a height of a principal structure which exceeds by 10 feet or 10% the maximum height permitted in the district for a principal structure. Such variance shall be granted only by affirmative vote of at least five members of the Board.
- Give direction pursuant to N.J.S.A. 40:55D-34, for issuance of a permit for a building or structure in the bed of a mapped street or public drainageway, flood control basin or public area reserved on an Official Map.
- Give direction pursuant to N.J.S.A. 40:55D-36 for issuance of a permit for a building or structure not related to a street.
- Grant, to the same extent and subject to the same restrictions as the Planning Board, subdivision or site plan approval pursuant to Part 3, Subdivision and Site Plan Review, or conditional use approval pursuant to Article XXIV whenever the Board of Adjustment is reviewing an application for approval of a variance pursuant to Subsection A(4) above. In reviewing said subdivision or site plan, the Board of Adjustment shall follow the same procedures and be guided by the same standards as the Planning Board as provided in Part 3, Subdivision and Site Plan Review, of this chapter and, to that end, may establish a Subdivision and Site Plan Committee to function in the same manner as the Subdivision and Site Plan Committee of the Planning Board.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the Borough will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report.

9.13.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Totowa's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.13-10 provides details regarding municipal-specific

loss and damages the Borough of Totowa experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.13-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	Downed trees due to high winds
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both directions west of CR 625 and Randolph Ave. due to flooding.	Flooded roadways which led to closures
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Downed trees, DPW overtime, debris

9.13.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.13-11 summarizes the Borough of Totowa risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.13-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	10,829	100-year MRP Hurricane:	3,771	100-year MRP Hurricane:	$1,337,883	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	2,347	NEHRP D&E:	867	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	68	Liquefaction Class 4:	34	500-year MRP building damages/loss:	$7,646,508	
						2,500-year MRP building damages/loss:	$106,302,620	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,044	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	661			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	1,017	1% annual chance	373	1% annual chance	$27,695,962	High
		0.2% annual chance	1,419	0.2% annual chance	916			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	99	Class A:	33	Class A:	$29,484,336	Moderate
		Class B:	3	Class B:	2	Class B:	$8,176,859	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	19	Number of buildings the hazard area:	6	Replacement cost value of buildings located in the hazard area:	$5,744,514	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Totowa.

- Number of repetitive loss (RL) properties: 40 (refer to 2020-TOTOWA-006 in Table 9.13-15)
- Number of severe repetitive loss (SRL) properties: 8 (refer to 2020-TOTOWA-006 in Table 9.13-15)
- Number of RL/SRL properties that have been mitigated: 5 through CDBG-DR funding

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.13-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Borough of Totowa FD – Lincoln Fire Com 2*	Fire	X	X	2020-TOTOWA-004
Totowa Wastewater Pump Station*	Wastewater Pump	X	X	The Borough is currently working on a project to protect this pump station from flood damage.
Totowa Wastewater Pump Station*	Wastewater Pump	X	X	The Borough is currently working on a project to protect this pump station from flood damage.
Totowa Wastewater Pump Station*	Wastewater Pump	X	X	The Borough is currently working on a project to protect this pump station from flood damage.

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- According to the 2007 Flood Insurance Study (FIS) for Passaic County, the Passaic River causes flooding in the Borough of Totowa in the low-lying areas near Totowa Road and Holy Sepulcher Cemetery. However, limited development along the Singac Brook and Naachtpunkt Brook and steep topography along the River have limited flooding within the Borough (FEMA FIS 2007).
- The 2006 Borough of Totowa Municipal Stormwater Management Plan states that the Borough exhibits water quantity problems including flooding and stream bank erosion. A majority of the flooding issues in Totowa are the result of portions of the Borough being located within the flood zones of the Passaic River. Isolated flooding conditions may be the result of undersized culverts associated with road drainage. During severe weather events, the undersized culverts do not have adequate capacity which causes a backwater effect and flooding upstream. Outfalls along the waterbodies in the Borough and drainage channels are not properly stabilized and erosion occurs during high intensity rainfall events. As the impervious surface areas increase in the Borough, the peak and volumes of stream flows have also increased. This results in stream bank erosion and unstable areas and degraded stream habitats (Alaimo Engineering Group 2006).

- The Lower Borough is one of the oldest areas in Totowa. The streets are notoriously narrow and undersized for today's SUVs and fire-fighting apparatus. The homes are built on narrow lots, which provide little to no off-street parking. Furthermore, portions of the Lower Borough are subject to flooding via backflow from the Passaic River. Finally, a large segment of the Lower Borough is in the AE flood zone. The Borough is concerned about access within Lower Borough, flooding and other quality of life issues (Master Plan 2016).

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Totowa that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Totowa has significant exposure. Refer to Figures 9.13-1 and 9.13-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Totowa. The Borough of Totowa has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough of Totowa indicated the following:

- Adjusted the overall ranking for coastal storm, changing it from high to low due to the history of occurrences and impacts.

Table 9.13-13. Borough of Totowa Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
Low	Low	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Medium	Medium	Medium	Low

9.13.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex

Table 9.13-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to ensure continuity of operations at critical facilities: 1. Fire Department (400 Riverview Drive) 2. Totowa Community Center (shelter) 393 Union Blvd. 3. Totowa Police Dispatch 4. Municipal Complex at 537 Totowa Road	OEM	In progress – keep generator for fire department and community center in the 2020 HMP	X	2020-TOTOWA-003
Conduct an engineering study to determine the most feasible and cost-beneficial flood mitigation action at the Fire Department (93 Lincoln Ave)	Engineering	No progress – include in the 2020 HMP	X	2020-TOTOWA-004
Rehabilitation of sanitary sewer lines in the lower Borough area (~400 houses); This prevents sanitary sewerage from backing up into people's homes when the pump station goes down. County funding addressed one street but additional funding is required to complete.	DPW	Complete and ongoing – continues to do this throughout the Borough – concentrating on the lower area		
U.S. Army Corps of Engineer (USACE) will conduct an engineering study to determine risk of dam failure (bordering Little Falls / Totowa / Wayne / West Paterson municipalities). The Borough will remain informed on this project.	USACE	Ongoing capability – Borough does not have jurisdiction over the project but attends the meetings regarding this project		
Engineering study to determine route of flooding and appropriate mitigation action for properties (including properties on the repetitive loss lists) on the following streets: Norwood	Engineering	Ongoing capability – acquiring homes (self-funded) – Riverview, Totowa and Norwood roads where homes have been acquired		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Terrace, Riverview Drive, Lincoln Avenue, Boyle Avenue, Charles Street, Franklin Place, Lewis Place, Williams Place, Totowa Road, Jackson Road, Madison Road, Vreeland Avenue, Maltese Drive, West End Road, Crescent Avenue, Margaret Street, and Rosalie Street				
Rebuild and/or relocate the following pump stations: 1. Relocate down the road outside the flood zone: Williams Street Sewer Pumping Station 2. Rebuild Riverview Pump Station (100 Riverview Drive)	Sewer Department	In Progress		
Install early warning communication system in the Borough (sirens or best available technology)	OEM	Ongoing Capability - the Borough has a reverse 911 system		
Join the CRS program which will include public education/outreach activities	NFIP FPA	No Progress	X	2020-TOTOWA-005
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress; 5 in process of being acquired). Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Elected Official's Office	Ongoing capability		

In addition to the actions completed above, the Borough completed the following:

- Generators were purchased and installed at DPW on Furler Street and Shepherds Lane pump station.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Totowa participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Totowa participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation

measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.13-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Totowa would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.13-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-TOTOWA-001	Lower Borough Feasibility Study	**Problem**: The Lower Borough is one of the oldest areas in Totowa. The streets are notoriously narrow and undersized for today's SUVs and fire-fighting apparatus. The homes are built on narrow lots, which provide little to no off-street parking. Furthermore, portions of the Lower Borough are subject to flooding via backflow from the Passaic River. Finally, a large segment of the Lower Borough is in the AE flood zone. The Borough is concerned about access within Lower Borough, flooding and other quality of life issues. **Solution**: Conduct a feasibility study of the entire Lower Borough area to determine how to reduce flood risk in the Lower Borough area. The study will include an investigation and evaluate solutions to help reduce or alleviate flood damage in this area.	Existing	Flood, Severe Weather	2, 6	Borough Engineer, Borough Administration, Borough DPW	FEMA HMGP or PDM, Borough Budget	Identify solutions to reduce flooding; provide protection to buildings, residents, and infrastructure	$25,000+	Within 3 years	High	LPR	PR
2020-TOTOWA-002	Update Flood Damage Prevention Ordinance	**Problem**: The current flood damage prevention ordinance (Chapter 189) states that any new development or substantial improvements must be elevated at or above the base flood elevation. This does not meet the minimum requirement set by the State of New Jersey. **Solution**: Update the current flood damage prevention ordinance to require new construction and substantial	New and Existing	Flood	All	Borough Administration	Borough Budget	Increase protection of development in the floodplain	<$10,000	Within 1 year	High	LPR	PR, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		improvements to be elevated at least one foot above the base flood elevation.											
2020-TOTOWA-003	Backup Power	**Problem**: The fire department (400 Riverview Drive) and Community Center (393 Union Blvd.) are both critical facilities for the Borough and provide essential services in the event of a disaster. However, both facilities do not have a form of backup power in the event of a power outage. Without power, the buildings cannot provide the essential services to the community. **Solution**: Working with the Borough engineer, identify the best size generator for each building. Once identified, purchase and install the generator and proper equipment.	Existing	All that can lead to power outage (Coastal Storm, Flood, Severe Storm, Severe Winter Storm, Wildfire)	1, 2, 6	Borough Engineer, Borough Administrator	FEMA HMGP and Borough Budget	Continuity of operations	$150,000	Within 2 years	High	SIP	PP, ES
2020-TOTOWA-004	Feasibility Study near Fire Department	**Problem**: The Borough Fire Department at 93 Lincoln Ave. is floodprone and has experienced flood-related damages in the past. It is uncertain what the best solution is to reduce or alleviate the flooding and damages. **Solution**: Conduct a feasibility study to determine the most feasible and cost-beneficial flood mitigation for the fire department.	Existing	Coastal Storm, Flood, Severe Weather	2, 6	Borough Engineer, Borough Fire Chief	FEMA PDM and FMA, Borough Budget	Identifies solutions to protect critical facility	$50,000+	Within 5 years	High	LPR	PR
2020-TOTOWA-005	CRS	**Problem**: The Borough is currently not in the CRS program; however, there 229 flood policies in the Borough with $59,909,100 insurance in force and $590,995 premium in-force. There have been 494	New and Existing	Flood	1, 2, 6	Borough Engineer, Floodplain Administrator	Borough Budget	Reduces flood insurance premiums; enhances public safety	$25,000+	Within 5 years	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		flood claims filed, totaling over $6.4 million. This shows the flood vulnerable to the Borough. The Borough is not in the CRS program. **Solution**: The Borough will work with FEMA to submit a CRS application and provide the required paperwork that is needed.											
2020-TOTOWA-006	Repetitive Loss and Severe Repetitive Loss Properties	**Problem**: There are 40 repetitive loss (RL) and 8 severe repetitive loss (SRL) properties in the Borough. These properties have experienced frequent flood damages based on NFIP claims filed. **Solution**: Conduct outreach to inform the residents with options to reduce or eliminate flood damage. The outreach will include information on what the homeowner can do now (elevate utilities, remove items from the basement, etc.) and mitigation options (acquisition or elevation). If the homeowner chooses acquisition or elevation, the Borough will apply for FEMA funding on their behalf.	Existing	Flood	1, 2, 6	Floodplain Administrator	Borough Budget	Enhances public safety and awareness; potentially remove structures out of floodprone areas	$25,000+	Within 5 years	Medium	EAP	PI

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.13-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-TOTOWA-001	Lower Borough Feasibility Study	1	1	1	1	1	1	0	0	1	1	1	1	0	0	10	High
2020-TOTOWA-002	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	0	0	1	0	1	0	0	9	High
2020-TOTOWA-003	Backup Power	1	1	1	1	1	1	0	0	1	1	1	1	1	0	11	High
2020-TOTOWA-004	Feasibility Study near Fire Department	1	1	1	1	1	1	0	0	1	1	1	1	1	0	11	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-TOTOWA-005	CRS	1	1	1	1	1	1	0	0	1	1	0	1	1	0	10	High
2020-TOTOWA-006	Repetitive Loss and Severe Repetitive Loss Properties	1	1	1	1	1	0	1	0	0	1	0	1	0	0	8	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.13-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storm	-004	-003				-003		
Dam Failure								
Disease Outbreak								
Drought								
Earthquake		-003				-003		
Extreme Temperature		-003				-003		
Flood	-001, -002, -004, -005	-002, -003	-006			-003		
Geological Hazard		-003				-003		
Hazardous Substances								
Infestation and Invasive Species								
Severe Weather	-001, -004	-003				-003		
Severe Winter Weather		-003				-003		
Wildfire		-003				-003		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.13.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Totowa followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.13-18. Contributors to the Annex

Name	Title	Method of Participation
Allan Burghardt	Construction Official and NFIP Floodplain Administrator (FPA)	Attended meetings, provided input throughout the planning process, identified mitigation strategies for the Borough
James Niland	Public Works	Attended meetings, provided input throughout the planning process, identified mitigation strategies for the Borough

Name	Title	Method of Participation
Joseph Wassel	Clerk	Attended meetings, provided input throughout the planning process, identified mitigation strategies for the Borough
Rich Schopperth	Fire Official	Attended meetings, provided input throughout the planning process, identified mitigation strategies for the Borough
Lisa Nash	CMFO/Finance	Reviewed the annex
Tom Lemanowicz	Brough Engineer	Reviewed the annex
John Coiro	Mayor	Reviewed the annex
Darlene Green	Land Use Planner	Reviewed the annex
Carmen Veneziano	Police Chief	Reviewed the annex

Figure 9.13-1. Borough of Totowa Hazard Area Extent and Location Map 1

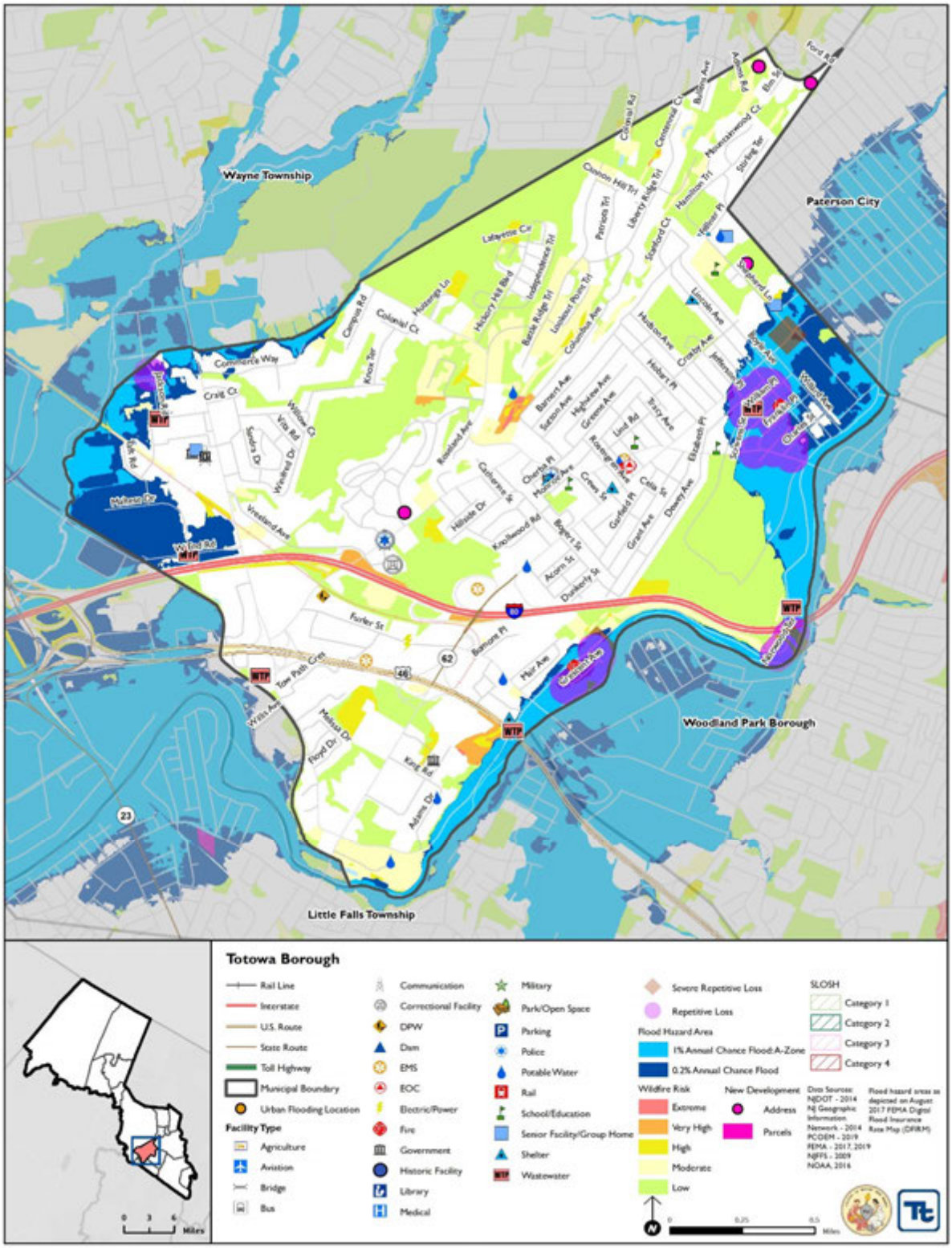
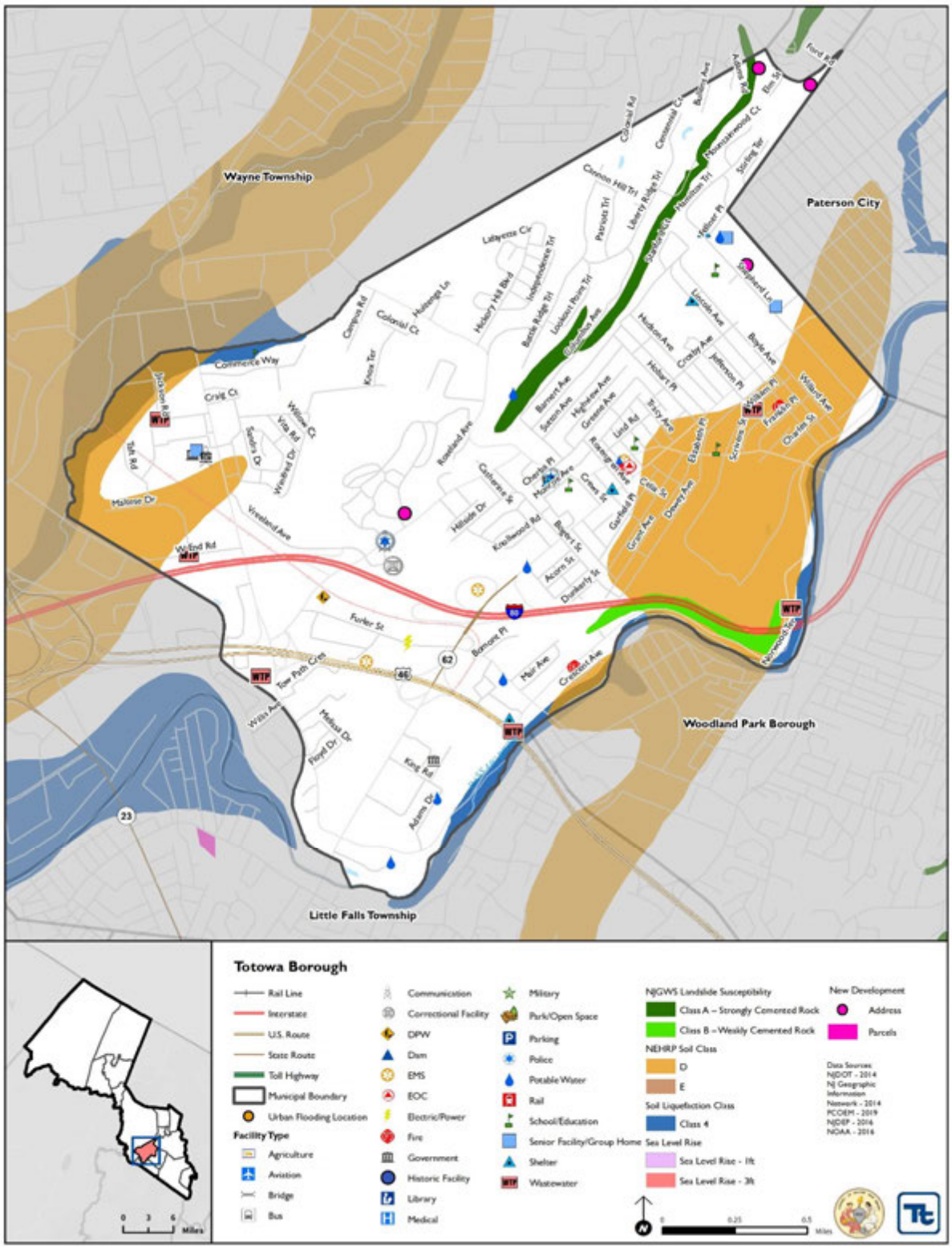


Figure 9.13-2. Borough of Totowa Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Lower Borough Feasibility Study		
Project Number:	2020-TOTOWA-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The Lower Borough is one of the oldest areas in Totowa. The streets are notoriously narrow and undersized for today's SUVs and fire-fighting apparatus. The homes are built on narrow lots, which provide little to no off-street parking. Furthermore, portions of the Lower Borough are subject to flooding via backflow from the Passaic River. Finally, a large segment of the Lower Borough is in the AE flood zone. The Borough is concerned about access within Lower Borough, flooding and other quality of life issues.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study of the entire Lower Borough area to determine how to reduce flood risk in the Lower Borough area. The study will include an investigation and evaluate solutions to help reduce or alleviate flood damage in this area.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Identify solutions to reduce flooding; provide protection to buildings, residents, and infrastructure
Useful Life:	N/A	**Goals Met:**	2, 6
Estimated Cost:	$25,000+	**Mitigation Action Type:**	LPR
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	As soon as grant funding is obtained
Estimated Time Required for Project Implementation:	Within 3 years	**Potential Funding Sources:**	FEMA HMGP or PDM, Municipal Budget
Responsible Organization:	Borough Engineer, Administration, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Construct flood walls around this portion of the Borough	$20,000+	Not feasible as it could impact natural drainage; costly; might restrict access to homes and businesses
	Acquire all properties in this area	$5 million+	Too costly; loss tax base; not all homeowners willing to relocate

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Lower Borough Feasibility Study	
Project Number:	2020-TOTOWA-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protect residents and business owners from flood damage
Property Protection	1	Protect buildings from flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to implement this study
Fiscal	0	Need funding to complete project
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	1	Within 3 years
Agency Champion	0	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Backup Power		
Project Number:	2020-TOTOWA-003		
Risk / Vulnerability			
Hazard(s) of Concern:	All that can lead to power outage		
Description of the Problem:	The fire department (400 Riverview Drive) and Community Center (393 Union Blvd.) are both critical facilities for the Borough and provide essential services in the event of a disaster. However, both facilities do not have a form of backup power in the event of a power outage. Without power, the buildings cannot provide the essential services to the community.		
Action or Project Intended for Implementation			
Description of the Solution:	Working with the Borough engineer, identify the best size generator for each building. Once identified, purchase and install the generator and proper equipment.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations
Useful Life:	15 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$150,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	As soon as grant funding is obtained
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	FEMA HMGP and Borough Budget
Responsible Organization:	Borough Engineer, Borough Administrator	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels	$50,000+	Weather dependent; maintenance; might not be able to provide full power to buildings
	Install wind turbines	$50,000+	Weather dependent; needs land to install

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Power	
Project Number:	2020-TOTOWA-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Benefits outweigh the costs – generators would allow buildings to provide continuity of operations during outages
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to implement this project
Fiscal	0	Need funding to complete project
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All that can lead to power outage
Timeline	1	Within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Feasibility Study near Fire Department		
Project Number:	2020-TOTOWA-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Flood, Severe Weather		
Description of the Problem:	The Borough Fire Department at 93 Lincoln Ave. is floodprone and has experienced flood-related damages in the past. It is uncertain what the best solution is to reduce or alleviate the flooding and damages.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to determine the most feasible and cost-beneficial flood mitigation for the fire department.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Identifies solutions to protect critical facility
Useful Life:	N/A	**Goals Met:**	2, 6
Estimated Cost:	$50,000+	**Mitigation Action Type:**	LPR
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	As soon as grant funding is obtained
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	FEMA FMA or PDM, Municipal Budget
Responsible Organization:	Borough Engineer, Borough Fire Chief	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Construct flood walls around the fire station	$20,000+	Not feasible as it could impact natural drainage; costly; might restrict access to station
	Relocate fire station	$5 million+	Too costly; no available land to relocate

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Feasibility Study near Fire Department	
Project Number:	2020-TOTOWA-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provide continuity of operations to residents during a flood event
Property Protection	1	Protect fire station from flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to implement this project
Fiscal	0	Need funding to complete project
Environmental	0	No negative or positive environmental impacts as a result of this project
Social	1	
Administrative	1	
Multi-Hazard	1	Coastal Storm, Flood, Severe Weather
Timeline	1	Within 5 years
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	

9.14 BOROUGH OF WANAQUE

This section presents the jurisdictional annex for the Borough of Wanaque. The annex includes a general overview of the Borough; an assessment of the Borough of Wanaque's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.14.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Wanaque's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.14-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Angelo Calabro / OEM Coordinator Address: Phone Number: 862-200-4121 Email: acalabro@wanaqueborough.com	Name / Title: Edward Schroeder / Deputy OEM Coordinator Address: Phone Number: 973-835-5600 Email: fdchief@wanaqueborough.com
NFIP Floodplain Administrator	
Name / Title: Michael Cristaldi / Engineer Address: Phone Number: 973-523-6200 Email: mcristaldi@alaimogroup.com	

9.14.2 Jurisdiction Profile

The Borough of Wanaque was incorporated as an independent municipality when Pompton Township was divided into the Boroughs of Bloomingdale, Wanaque and Ringwood in 1918 (Snyder, 1969).

Wanaque is governed under the Borough form of government (Borough of Wanaque, 2014). The Borough has a total land area of 9. 3 square miles, of which 8 square miles is land and 1. 3 square miles is water. It is located in the Highlands Region with portions both in the Planning and Preservation Areas.

According to the U.S. Census, the 2010 population for the Borough of Wanaque was 11,116. The estimated 2017 population was 11,782, a 6-percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.7 percent of the population is 5 years of age or younger and 22.4 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.14.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. As noted above, portions of the Borough are located in the Highlands Preservation Area and Highlands Planning Area. According to the Master Plan Re-Examination, development in the designated Preservation Area is extremely limited and nearly all development and redevelopment will take place in the designated Planning Area in the future (Wanaque Town Center also known as the Haskell and Midvale Centers). The following table summarizes recent and expected future development trends, including major residential/commercial

development and major infrastructure development. Figures 9.14-1 and 9.14-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.14-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	The annual permit numbers are not available at this time. There was 241 new residential units constructed (apartments and condominiums since 2014). There is mainly redevelopment occurring in the Borough.				
Multi-Family					
Other (commercial, mixed-use, etc.)					
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Apartments and Condos	Residential	241			
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Lakeland Village	Residential	2	4th Avenue	None	
Parkside	Residential		4th Avenue		
Residential	Residential		1049 Ringwood Ave	Moderate Wildfire	
Residential	Residential		547 Ringwood Ave	NEHRP – D Class Soils	

** Only location-specific hazard zones or vulnerabilities identified.*

9.14.4 Capability Assessment

The Borough of Wanaque performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.14.4). The Borough of Wanaque identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Wanaque.

Table 9.14-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes		
Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019.					
Zoning Code	Yes	Local Planning board	Yes		
Comment: *Certain size development may require an environmental impact statement* *Chapter 114 – Boro Code; State permissive on local level. [note local ordinance # and date of adoption]. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.*					
Subdivisions	Yes	Local Planning board	Yes		
Comment: Chapter 98 – Boro Code *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.*					
Stormwater Management	Yes	State and local	Yes		
Comment: *Chapter 95 – Borough Code; adopted April 1998; ordinance no.88* *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* *The Borough Stormwater Management Regulations are in Chapter 95. The purpose of this chapter is regulate the development of real property and to establish standards to regulate the additional discharge of stormwater runoff from such development as provided in the chapter. The Borough engineer reviews to determine if development applications meet the standards in the ordinance.*					
Post-Disaster Recovery	No				
Comment: See Emergency Management plan.					
Real Estate Disclosure	No	State			
Comment: Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.					
Growth Management	No	State and local			
Comment: State Mandated on a municipal level. See Zoning Ordinance. Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.					
Site Plan Review	Yes	Planning Board			
Comment: *Chapter 98 – Borough Code* *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by county planning board and for the approval of those subdivisions affecting county road or drainage facilities. 40:27-6.10: Each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map.*					
Environmental Protection	Yes				
Comment: The rules that are utilized by the NJ Department of Environmental Protection and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Flood Damage Prevention	Yes	Federal, State, Local	Yes		
Comment: *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance.* *Ordinance # 3-0-2020* *The Flood Damage Prevention Ordinance was recently updated with the new maps (March 9, 2020); Ordinance 3-0-2020. It is administered by the Floodplain Administrator (Borough Engineer). It is the purpose of the ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed. Updated flood ordinance was adopted February 2020.* *a. To protect human life and health;* *b. To minimize expenditure of public money for costly flood control projects;* *c. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* *d. To minimize prolonged business interruptions;* *e. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* *f. To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* *g. To ensure that potential buyers are notified that property is in an area of special flood hazard; and* *h. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					
Wellhead Protection	Yes	Local	Yes		
Comment: Chapter 112 of Borough Code (May 2004); Underlying the Borough is a major source of existing and future water supplies; groundwater lies within the Buried Valley Aquifer Systems of the Central Passaic River Basin designated as a 'sole source' aquifer under the Safe Drinking Water Act of 1974. Delineation of well head protection areas (WHPAs) is part of the NJ-approved 1991 well head protection plan (WHPP) for public community water supply wells. These are priority areas for efforts to prevent and clean up ground water contamination. Municipalities are empowered to regulate land use, physical facilities and other activities within WHPAs areas, the potential for groundwater contamination can be reduced under the provisions of the New Jersey Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., which authorizes each municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents. Also refer to Safe Drinking Water Regulations (NJAC 7:10-11.7(b)1)).					
Emergency Management	Yes	OEM			
Comment: Chapter 5 (Civil Defense Agency) which discusses hazard events, natural and non-natural including flood, fire and earthquakes. Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. See Emergency Operations Plans below.					
Climate Change	No				
Comment:					
Disaster Recovery Ordinance	No				
Comment:					
Disaster Reconstruction Ordinance	No				
Comment:					
Other					
Comment: *Shade Tree Ordinance, Chapter 92 of Borough Code*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local Planning Board			
Comment: *Master Plan Re-examination report (2010). A lot of redevelopment occurring within Borough.* *Per NJSA: Yes, if planning board (40:55D-28) and must be re-examined every ten years (40:55D-89.1); County: Yes (40:27-2).*					
Capital Improvement Plan	Yes	Local			

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Capital Improvement as part of municipal budget* *Per NJSA 40:55D-29) the governing body is authorized to direct the planning board to prepare a CIP with at least a six-year planning horizon.*					
Disaster Debris Management Plan	No				
Comment: *The County is currently leading a Debris Management Plan update in which all municipalities are participating. This is being worked on with the State and is still in progress.*					
Floodplain or Watershed Plan	Yes	Local			
Comment: *Administration, Chap. 95 Boro code*					
Stormwater Management Plan	Yes	Local			
Comment: *Chapter 95 of Borough Code; lakes and waterways in the Borough at times are subject to flooding which is a danger to lives, property and natural resources int eh Borough; new development tends to accentuate flooding by increasing stormwater runoff; ordinance regulates stormwater runoff from such developments.* *Part of Borough Code, 1987 Plan?* *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).*					
Stormwater Pollution Prevention Plan	Yes	Borough Engineer			
Comment: Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).					
Urban Water Management Plan	No				
Comment:					
Habitat Conservation Plan	No				
Comment: May develop a conservation plan element in master plan per NJSA 40:5D-28b (8).					
Economic Development Plan	Yes	Local			
Comment: Administration, Redevelopment ordinances *Per NJSA 40:55D-28b. (9) There can be a generic Economic Development Element of the County Comprehensive Plan. Municipality can establish Economic Development Commission that can facilitate incentive programs (façade programs, low-interest loans, etc.)*					
Shoreline Management Plan	No				
Comment:					
Community Wildfire Protection Plan	No				
Comment:					
Community Forest Management Plan	No				
Comment: Optional accreditation for county and municipalities for reduction of liability, New Jersey Urban and Community Forestry Program (NJUCF).					
Transportation Plan	No				
Comment: May develop a circulation plan element in master plan per NJSA 40:55D-28b. (4).					
Agriculture Plan	No				
Comment: May develop a farmland preservation plan element per NJSA 40:5D-28b (13).					
Climate Action Plan	No				

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: May develop a green building and environmental sustainability plan element per NJSA 40:5D-28b (16).					
Tourism Plan	No				
Comment:					
Business Development Plan	Yes				
Comment:					
Other					
Comment: • Open Space Plan, Yes, Local, County, Administration, Open Space Plan Inventory					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local, County			
Comment: OEM, Annexes *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No				
Comment: *Informal planning process*					
Post-Disaster Recovery Plan	Yes	OEM			
Comment: *Refer to EOP*					
Continuity of Operations Plan	Yes	OEM			
Comment: *Refer to EOP*					
Public Health Plan	Yes				
Comment:					
Other					
Comment:					

Table 9.14-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Construction/Zoning
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes Covered in housing element to master plan. Open Space Plan Inventory

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Wanaque.

Table 9.14-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	
Environmental Board / Commission	No	
Open Space Board / Committee	Yes	Administration
Economic Development Commission / Committee	No	
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Swift911
Maintenance program to reduce risk	No	
Mutual aid agreements	Yes	Administration, Police, Fire, Court, Code Enforcement
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	Yes	Administrator
Staff with training in green infrastructure	Yes	Engineer
Staff with education/knowledge/training in low impact development	Yes	Borough Engineer
Surveyor	Yes	Borough Engineer
Stormwater engineer	Yes	Borough Engineers
Personnel skilled or trained in GIS applications	Yes	Borough Engineer
Local or state water quality professional	Yes	Licensed Operators (Borough DPW)
Scientist familiar with natural hazards in local area	Yes	Borough Engineer
Emergency manager	Yes	Police Chief
Watershed planner	Yes	North Jersey District Water Commission
Environmental specialist	Yes	Contractors as needed.
Grant writers	Yes	Administrator
Resilience Officer	No	
Other		

Fiscal Capability

The table below summarizes financial resources available to the Borough of Wanaque.

Table 9.14-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Passaic County CDBG
Capital Improvements Project Funding	Yes – Borough
Authority to Levy Taxes for Specific Purposes	Yes – Borough
User Fees for Water, Sewer, Gas or Electric Service	Yes – Water & Sewer
Incur Debt through General Obligation Bonds	Yes – Borough
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No

Financial Resource	Accessible or Eligible to Use?
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Wanaque.

Table 9.14-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Borough Clerk or Mayor/Council
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Facebook, Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Social Media, Municipal Website, Swift 911
Do you have any established warning systems for hazard events? • If yes, briefly describe.	LED Sign on Borough Hall

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Wanaque.

Table 9.14-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule (BCEGS)	No		
Public Protection (Fire ISO Protection Class)	Yes	7	2010
Storm Ready Certification	No		
Firewise Community Classification	No		
Sustainable Jersey	No		

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the

adaptive capacity for climate change and the jurisdiction's rating for each natural hazard of concern in the HMP update.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	Yes
Is the administrative supportive of integrating climate change in policies or actions?	Yes
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Severe Weather	Medium
Severe Winter Weather	Low – *Ringwood Ave is a single-lane route with no side-street detour. Storms close Skyline Drive and all traffic is diverted o Ringwood Ave and Borough's mobility of emergency vehicles affected*
Wildfire	Medium
Hazardous Materials	Medium
Disease Outbreak	Medium

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.14-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Michael Cristaldi, Borough Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	March 9, 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	November 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No

Criterion	Response
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	TBD
˜ If so, what type of assistance/training is needed?	
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	40 policies (5 NFIP, 35 WYO) $11,635,000
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	43 total paid claims $119,771,372
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of July 31, 2019*

WYO = Write Your Own

9.14.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Stormwater Management Plan (2006):** The Borough's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this Plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. The Plan also outlines changes to the Borough's land use and zoning ordinances that will include nonstructural stormwater management strategies.
- **Master Plan Re-Examination (2010):** The objectives of the plan include protecting and preserving the Borough's environmental resources in accordance with the goals of the Highland's Council for both the Preservation and Planning Areas.
- **Ordinance Amending Chapter 114, Zoning to 'Article XVI Highlands Area Land Use Guidelines (2008):** Borough's Master Plan and related zoning provisions of the Borough Code would conform with the New Jersey Highlands Act and the rules and regulations of the New Jersey Highlands Council. May 2012 the Borough Planning Board adopted a Resolution approving the Highlands Element of the Master Plan and separately, adopted a Resolution approving the Housing Element of the Master Plan and Fair Share Plan.

- The Borough has their ordinances and flood protection measures available on their website. Please visit the Borough of Wanaque website at http://www.wanaqueborough.com/ for further information.
- The Borough adopted an updated Flood Damage Prevention Ordinance for the new maps in March 2020.
- The Borough has an Open Space and Recreation Advisory Committee.
- **Outreach:** The Borough's website posts information regarding current events and general advisories pertaining to its residents. The Borough participates in the CodeRED Emergency Alert System and provides a link on the website for residents to sign-up. The Police Department's webpage provides residents with information on hurricane preparedness and links to the National Hurricane Center and the American Red Cross' Hurricane Tracker app. There is also information on applying for FEMA assistance.

Opportunities for Future Integration

As this HMP update is implemented, the Borough will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The Borough has identified a new mitigation action to review the Hazard Mitigation Plan update when updating the Master Plan. Refer to Table 9.14-11.

9.14.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Wanaque's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.14-10 provides details regarding municipal-specific loss and damages the Borough of Wanaque experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.14-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	Wind damage, power outages, debris
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both	Wind damage, power outages, debris

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
			directions west of CR 625 and Randolph Ave. due to flooding.	
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Significant debris removal, fencing damage,2 scoreboards destroyed, road closures including Greenwood Ave with a tree, back beach road, Chatham Estates, Wolf Drive closed due to trees down, power outages

9.14.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.14-11 summarizes the Borough of Wanaque's risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.14-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	11,782	100-year MRP Hurricane:	3,157	100-year MRP Hurricane:	$437,178	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	1,981	NEHRP D&E:	567	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$1,950,568	
						2,500-year MRP building damages/loss:	$28,497,719	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,595	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	730			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	272	1% annual chance	81	1% annual chance	$2,338,238	High
		0.2% annual chance	1,347	0.2% annual chance	185			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	12	Class A:	5	Class A:	$6,592,467	Moderate
		Class B:	142	Class B:	37	Class B:	$16,062,365	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	16	Number of buildings the hazard area:	11	Replacement cost value of buildings located in the hazard area:	$9,618,571	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Wanaque.

- Number of repetitive loss (RL) properties: 6
- Number of severe repetitive loss (SRL) properties: 1
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain and the status of their mitigation to the flood hazard.

Table 9.14-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Haskell Well 1 - Back Beach Road at Back Beach Park	Potable well	X	X	2020-Wanaque-005
Meadowbrook Well 1 - Meadowbrook Rd & Willow Way	Potable well	X	X	2020-Wanaque-005
Regional Wastewater Treatment Facility	Wastewater	X	X	2020-Wanaque-005
Wanaque Wastewater Pump Station - Rhonda Pl.	Wastewater	X	X	2020-Wanaque-005

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- According to the 2007 Flood Insurance Study (FIS) for Passaic County, flooding from the Wanaque River affects the Borough of Wanaque. The Borough also experiences flooding from Posts Brook, Meadow Brook, and High Mountain Brook. Flooding typically occurs in the low-lying areas along these waterbodies (FEMA FIS 2007).
- The Borough of Wanaque Municipal Stormwater Management Plan indicates the Borough has exhibited water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. Many of the culverts associated with road drainage are undersized. During severe weather events, these undersized culverts do not have adequate capacity, thereby causing a backwater effect and flooding upstream. Numerous outfalls along the various waterbodies within the Borough are not property stabilized and severe erosion occurs during high intensity rainfall events. As impervious areas increased in the Borough, the peak and volumes of stream flows have also increased. The increased amount of water has resulted in stream bank erosion, thus resulting in unstable areas and degraded stream habitats (Borough of Wanaque 2006).
- Ringwood Ave, Orchard St., Park Ave experience stormwater flooding receding in about an hours time, but need to be closed for the duration.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Wanaque that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Wanaque has significant exposure. Refer to Figures 9.14-1 and 9.14-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Wanaque. The Borough of Wanaque has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough of Wanaque indicated the following:

- Severe weather and severe winter weather hazards were ranked high in the 2015 HMP; however due to advanced forecasting and capabilities, as well as the magnitude of impacts related to these frequent events, their ranking was reduced to a medium.

Table 9.14-13. Borough of Wanaque Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Medium	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Low	Medium	Medium	Medium	Medium

9.14.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.14-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Ensure continuity of operations at critical facilities. At this time the following projects are identified: 1.Wanaque EMS generator 2.Wanaque Fire House generator 3. Generator Retrofit for Lakeland Regional High School	Borough	1. Complete (2017) 2. Fire Company 1 and 2 Complete (2017) 3. Complete		
Utilize the HMP to include hazard mitigation in the next Master Plan update.	Borough	In development	Yes	2020-Wanaque-006
Increase public outreach to inform citizens on hazards (e.g., safe practices on using generators, flood hazard information, what to do in an emergency).	Elected Official's Office	Limited, ongoing through social media. This project is being removed because it is considered a capability.		
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Currently, the Borough would like to flood proof flood prone properties along Dupont Ave, Makemoney Avenue and Evergreen Avenue Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering	Flooding occurs only from high intensity, short duration rain events, may not be possible to quantity benefits for application. The Borough is mitigating by addressing drainage issues as identified in the updated mitigation strategy. Will maintain action to keep mitigation option for property owners but need to evaluate further. Refer to 2020-Wanaque-001, 2020-Wanaque-002		2020-Wanaque-005
Dredge/deepen/widen Post Brook at Ringwood Avenue (major thoroughfare/ evacuation route)	Engineering	No action. Discontinue. There is no feasible solution. Portions are privately owned.		
Dredge/deepen/widen Posts Brook tributary at DuPont Avenue and Makemoney Avenue	Engineering	No action. Discontinue. There is no feasible solution. Portions are privately owned.		

In addition to the above progress, the Borough of Wanaque identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- Completed 4th Avenue drainage project to alleviate street and property flooding and yard erosion.
- Tremont Terrace addressed property erosion.
- Lakeland Village drainage project to alleviate street and property flooding and yard erosion.
- Parkside cleaned and lined stormwater vault to alleviate localized flood.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Wanaque participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Wanaque participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.12-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Wanaque would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.14-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Wanaque-001	Lines Avenue Stream Channel Restoration	**Problem:** The Post Brook channel wall is collapsing with flood threat to approximately 90 acres, residential area. Preliminary feasibility and engineering work has been conducted by the Borough to determine the Morningside Place to Line Avenue drainage. After Lines Avenue the stream enters NJDWSC property and discharges to the Wanaque River.	**Solution:** Replace existing and potentially widen the wall on Lines Avenue. Evaluate the feasibility study and implement mitigation.	Existing	Coastal Storm, Flood, Severe Storm	1, 2, 4	Borough Engineering	Municipal budget for feasibility study; FEMA HMA for implementation	High	High	Short	High	NSP	NR
2020-Wanaque-002	Second Avenue Drainage Project	**Problem:** There is inadequate drainage on 2nd Avenue.	**Solution:** A feasibility study is needed to determine mitigation alternatives to protect to a 25-year storm event	Existing	Coastal Storm, Flood, Severe Storm	1, 2	Borough Engineering	FEMA HMA; Local match	High	High	Short	High	SIP	PP
2020-Wanaque-003	Purchase and install generators at critical facilities	**Problem:** The following critical facilities do not have backup power to ensure continuity of operations: 1. Conklintown Road Booster – this pumps potable water supply to higher elevations and is needed to supply potable water and for fire suppression to a population of 150. 2. The Haskell DPW on First Ave is also without backup power and provides critical functions to residents. 3. Fox Den Water DPW facility needs backup power to ensure continuity of public water supply and fire suppression.		Existing	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1, 2, 6	Borough Engineering	FEMA HMA; Local match	High	High	Short	High	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: Install generators to provide backup power to critical facilities.												
2020-Wanaque-004	Fox Den Enhanced DPW Facility	**Problem:** The current DPW is located on one side of the Borough. There is only one bridge crossing in the Borough which makes it a challenge to get fuel and resources to service the other end. The Borough needs an alternate DPW location to service the northern section of town that can be cut off during hazard events.	**Solution:** Enhance Fox Down location with fuel, bulk salt supply, and stand by generator to service community	Existing	Coastal Storm, Earthquake, Flood, Geological, Severe Storm, Severe Winter Storm	1,2,6	Borough Engineering	Municipal	High	High	Short	High	SIP	PP
2020-Wanaque-005	Mitigate flood-prone critical facilities	**Problem:** The following critical facilities are located in the floodplain. It is unknown at this time of their mechanicals are above or below the BFE and further investigation is needed to determine mitigation alternatives to ensure continuity of operations**.** 1. Haskell Well 1 – Back Beach Park 2. Meadowbrook Well 3. Regional Wastewater Treatment Facility 4. Wanaque Wastewater Pump Station	**Solution:** Conduct a feasibility study for design of critical facility mitigation alternatives in the floodplain.	Existing	Coastal Storm, Flood, Severe Storm	1, 2, 6	Borough Engineer	Municipal	High	Low	Short	Medium	LPR	PR
		Problem: The Master Plan will be updated in the future and does not		Both	All	All	Planning Board	Municipal	High	Low	Short		LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Wanaque-006	Integrate HMP into Master Plan Update	integrate the updated floodplain data and all hazards in this HMP.	**Solution:** Integrate the HMP into the next Master Plan update.									Medium		
2020-Wanaque-007	Mitigate flood-prone private property	**Problem:** There are repetitive loss properties in the Borough. The flooding is caused by heavy rain events in short durations and a drainage capacity issue. Other measures are being proposed to address flooding; however, outreach needs to be conducted to homeowners.	**Solution:** Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone area that experience frequent flooding (high risk areas).	Existing	Flood, Severe Storm	1, 2	Borough	FEMA HMA, homeowner match	High	High	Long	Medium	SIP	PP

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.14-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Wanaque-001	Lines Avenue Stream Channel Restoration	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-Wanaque-002	Second Avenue Drainage Project	1	1	1	1	0	0	0	1	1	0	1	0	0	1	8	High
2020-Wanaque-003	Purchase and install generators at critical facilities	1	1	1	1	1	1	1	0	1	1	1	1	1	0	12	High
2020-Wanaque-004	Fox Den Enhanced DPW Facility																
2020-Wanaque-005	Mitigate flood-prone critical facilities	1	1	1	1	1	1	0	0	1	1	1	1	0	0	10	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Wanaque-006	Integrate Master Plan into HMP Update	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	Medium
2020-Wanaque-007	Mitigate flood-prone private property	1	1	1	1	1	1	0	0	1	1	1	1	0	0	10	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.14-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	-006	-001, -002, -007		-001	-003, -004	-004, -005, -006		
Dam Failure	-006				-003, -004			
Disease Outbreak	-006				-003, -004			
Drought	-006				-003, -004			
Earthquake	-006				-003, -004			
Extreme Temperature	-006				-003, -004			
Flood	-006	-001, -002, 007		-001	-003, -004	-004, -005, -006		
Geological Hazards	-006				-003, -004			
Hazardous Substances	-006				-003, -004			
Infestation and Invasive Species								
Severe Storm	-006	-001, -002, -007		-001	-003, -004	-004, -005, -006		
Severe Winter Weather	-006				-003, -004			
Wildfire	-006				-003, -004			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.14.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Wanaque followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.14-18. Contributors to the Annex

Entity	Title	Method of Participation
Edward Schroeder	Deputy OEM and Police	Participated in Municipal annex workshop and Local annex meeting
Michael Cristaldi	Engineer and NFIP Floodplain Administrator	Participated in Municipal annex workshop and Local annex meeting
Michael Brusco	Superintendent of Public Works	Participated in Municipal annex workshop and Local annex meeting

Entity	Title	Method of Participation
Angelo Calabro	OEM Coordinator and Police	Participated in Municipal annex workshop and Local annex meeting
Marann Brindisi	CFO/Finance	Reviewed the annex
Daniel Mahler	Mayor	Reviewed the annex
Paul Carelli	Borough Administrator	Reviewed the annex
Mark Oliveri	Fire Official	Reviewed the annex

Figure 9.14-1. Borough of Wanaque Hazard Area Extent and Location Map 1

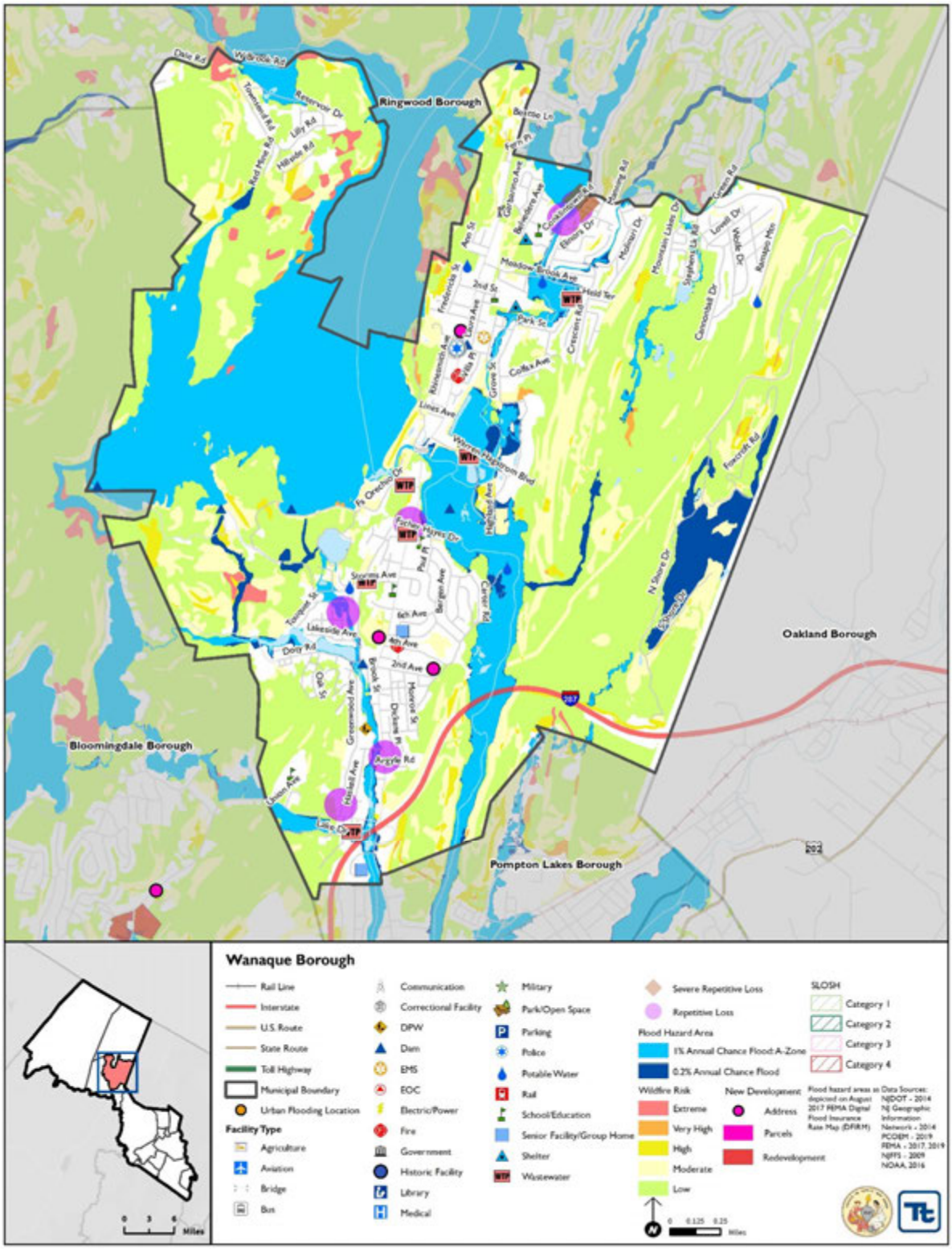
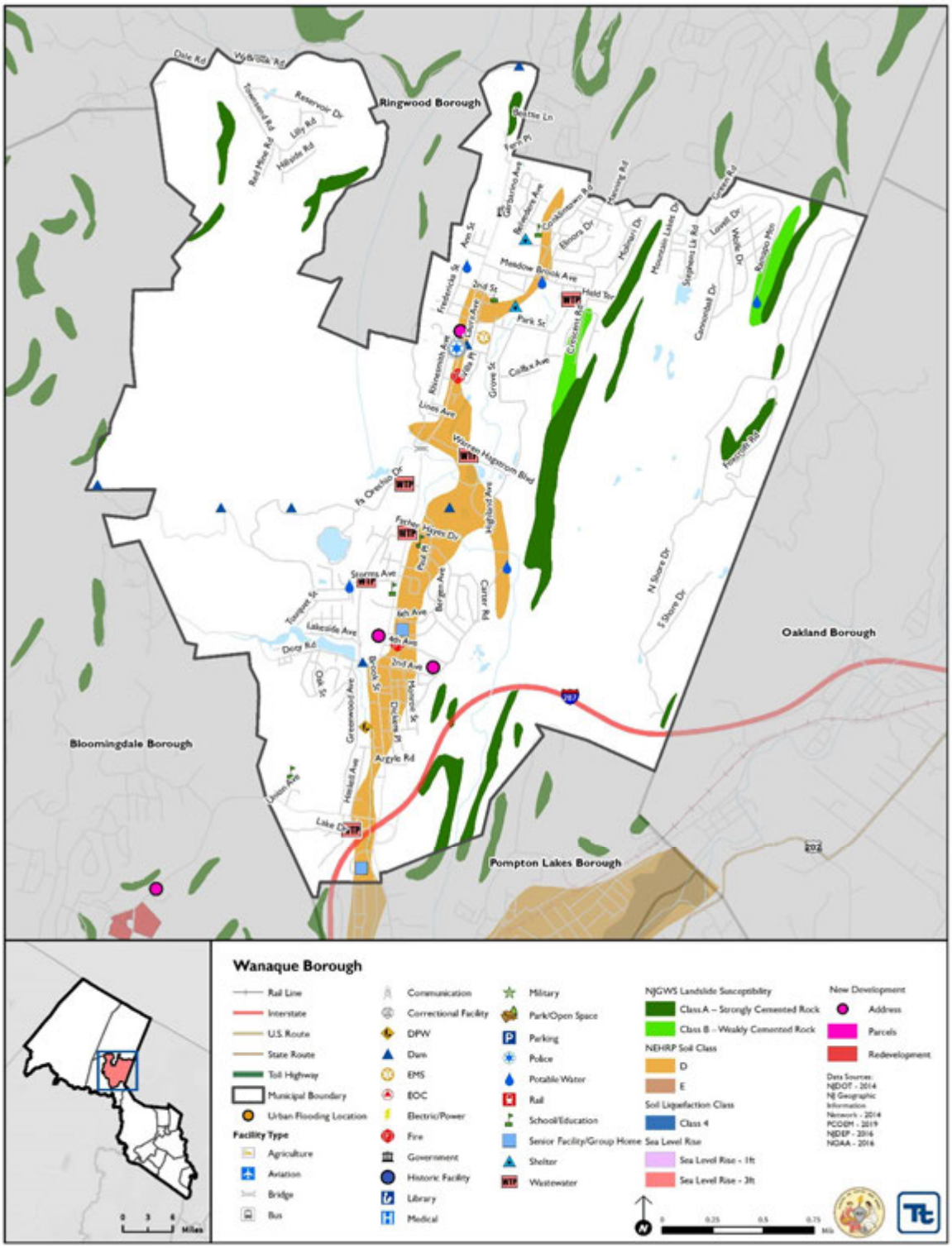


Figure 9.14-2. Borough of Wanaque Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Lines Avenue Stream Channel Restoration		
Project Number:	2020-WANAQUE-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Imminent collapse of side of embankment that would potentially flood approximately 9 acres in a residential area		
Action or Project Intended for Implementation			
Description of the Solution:	Replace and potentially widen the existing wall		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	100-year storm	**Estimated Benefits (losses avoided):**	$2,250,000
Useful Life:	80 to 100 years	**Goals Met:**	Protect life and property
Estimated Cost:	$400,000	**Mitigation Action Type:**	Natural System Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short – as soon as possible
Estimated Time Required for Project Implementation:	Shove ready to go	**Potential Funding Sources:**	Municipal funds seeking additional funding through FEMA HMA – NJDEP permit requirement created significant additional costs
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	None

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate structures	High	Flooding continues but reduces flood damage
	Buyout structures	High	Still floods; Borough loses rateables

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Lines Avenue Stream Channel Restoration	
Project Number:	2020-Wanaque-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Second Avenue Drainage Project		
Project Number:	2020-WANAQUE-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Insufficient drainage capacity along Second Avenue		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to determine potential mitigation alternatives to alleviate flooding		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	25 year storm	**Estimated Benefits (losses avoided):**	$250,000
Useful Life:	80 to 100 years	**Goals Met:**	1
Estimated Cost:	$100,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	2 months	**Potential Funding Sources:**	Municipal
Responsible Organization:	Municipal Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	None

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Relocate drainage	$3 Million	Not adequate
	Purchase private property	$750,000	Decreases property damage but flooding continues

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Second Ave Drainage	
Project Number:	2020-Wanaque-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	
Timeline	0	
Agency Champion	0	
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Install generators		
Project Number:	2020-WANAQUE-003		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	There is a lack of backup power at critical facilities which provide water supply, fire suppression and other critical functions.		
Action or Project Intended for Implementation			
Description of the Solution:	Install permanent generators to provide continuity of operations: 1. Conklintown Road Booster – this pumps potable water supply to higher elevations and is needed to supply potable water and for fire suppression to a population of 150. 2. The Haskell DPW on First Ave is also without backup power and provides critical functions to residents. 3. Fox Den Water DPW facility needs backup power to ensure continuity of public water supply and fire suppression.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:		**Estimated Benefits (losses avoided):**	High ($500,000 to $1M)
Useful Life:	30 years	**Goals Met:**	1,2,6
Estimated Cost:	$500,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	4 months	**Potential Funding Sources:**	FEMA HMA; Municipal match
Responsible Organization:	Municipality	**Local Planning Mechanisms to be Used in Implementation if any:**	None

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install hookup	Low	A shared generator may not provide continuity needed at multiple locations if power goes out across Borough
	Identify water supply and fire suppression outside of Borough	High	Not feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Install generators	
Project Number:	2020-Wanaque-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	1	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	13	
Priority (High/Med/Low)	High	

9.15 TOWNSHIP OF WAYNE

This section presents the jurisdictional annex for the Township of Wayne. The annex includes a general overview of the Township of Wayne; an assessment of the Township of Wayne's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.15.1 Hazard Mitigation Planning Team

The following individuals are the Township of Wayne's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.15-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Dan Daly, OEM Coordinator Address: 475 Valley Road Wayne, NJ 07470 Phone Number: 973-633-3580 Email: dalyd@waynetownship.com	Name / Title: Neal Bellet, Business Administrator Address: 475 Valley Road Wayne, NJ 07470 Phone Number: 973-633-3202 Email: belletn@waynetownship.com
NFIP Floodplain Administrator	
Name / Title: Heather Vitz-Del Rio, Township Engineer, Director of Public Works and Engineering Address: 475 Valley Road Wayne, NJ 07470 Phone Number: 973-694-1800 x3219 Email: vitzdelrih@waynetownship.com	

9.15.2 Jurisdiction Profile

According to the History of Wayne, the Township was first settled in the late 1600's after the area was purchased in 1695. The area underwent many jurisdictional changes until 1847 when the Township became an incorporated municipality. Throughout its development, Wayne was a farming community with grist, saw and cider mills and blacksmith shops. Its location along the Morris Canal made it a suitable location for development and trade, as well as vacationers from New York City.

The Township is governed by the Mayor/Council form of government under the Faulkner Act (Township of Wayne, 2014). According to the U.S. Census Bureau, the Township has a total land area of 25.174 square miles, of which 23.728 square miles is land and 1.446 square miles is water.

According to the U.S. Census, the 2010 population for the Township of Wayne was 54,717. The estimated 2017 population was 55,154, a 0.8 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.0 percent of the population is 5 years of age or younger and 18.3 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.15.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.15-2 summarizes recent and expected future development trends, including major

residential/commercial development and major infrastructure development. Figures 9.15-1 and 9.15-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.15-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	16	6	4	8	6
Multi-Family	1	0	2	0	1
Other (commercial, mixed-use, etc.)	7	7	6	6	5
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
FedEx Ground	Shipping/Distribution	163,000 sq. ft.	75 Demarest Drive	None	Complete/Operational
Driscoll Foods	Warehouse/Distribution	337,000 sq. ft.	74-76 Demarest Drive	None	Complete/Operational Bright
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Bright View	Assisted Living Facility	170 Units	1166 Hamburg Turnpike	NEHRP – Class D Soils	Under Construction

** Only location-specific hazard zones or vulnerabilities identified.*

9.15.4 Capability Assessment

The Township of Wayne performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Wayne.

Table 9.15-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local/State	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. The Building Department enforces the UCC.*					
Zoning Code	Yes	Local	Yes	No	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Zoning Regulations Chapter 134 Article III is enforced by the Building Department. "It is the purpose of the Township in adopting this Land Development Chapter to implement the adopted Master Plan of the Township of Wayne and exercise to the fullest the powers granted to the Township by the State of New Jersey to manage land use and development through zoning, subdivision and site plan regulations, planned development, soil erosion and sediment control, flood plain regulations, soil removal and control of fill, environmental protection provisions, historical preservation and through the police power generally. It is the further purpose of the Township in adopting this chapter to organize and codify all such powers of land use management into one comprehensive and cohesive system which will facilitate administration and minimize procedural difficulties and technical conflicts inherent in separate ordinances, while providing maximum protection of the public health, safety, morals and general welfare in accordance with the provisions of N.J.S.A. 40:55D-2 et seq., through the full exercise of the land use management powers available to the Township."*					
Subdivisions	Yes	Local	Yes	No	-
Comment: *Chapter 297 of the Township code. Planning and Zoning enforce the Subdivision Code. State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Chapter 134 Land Development of the Township code is enforced by the Building Department.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 433 of the municipal code; DPW enforces. The Stormwater Control Ordinance establishes minimum stormwater management requirements and controls for major development. Chapter 177 Stormwater Management Regulations is enforced by the DPW. "The Governing Body hereby finds and declares that regulations to prohibit the spilling, dumping, or disposal of materials other than stormwater to the municipal separate storm sewer system (MS4) operated by the Township of Wayne are necessary so as to protect public health, safety and welfare."*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	Local	Yes	-	-
Comment: *State mandated at local level*					
Shoreline Development	No	-	No	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	No	-
Comment: *MLUL NJ 40:55d. Chapter 134 Article V Site Plan and Subdivision Standards is administered by the Planning Department.*					
Environmental Protection	Yes	State, County, and Local	Yes	No	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Chapter 32 (Air Pollution Control) and Chapter 134 Article VI (Environmental Protection) are administered by the Passaic County Department of Health.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Flood Damage Prevention	Yes	Local	Yes	Yes	-
***Comment**: Chapter 134-97 Floodplain regulations. Administered by the FPA.*					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	Yes	Local	-	No	-
***Comment:** Chapter 13 Fire Department and Chapter 25 Police Department.*					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local/State	Yes	No	-
***Comment:** 3/24/14; MLUL NJ 40:55d. Administered by Planning. The Master Plan was last reexamined in 2010.*					
Capital Improvement Plan	Yes	Local	Allowed	No	-
***Comment:** The Municipal Budget is updated by Administration.*					
Disaster Debris Management Plan	No		No	-	-
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	No	-
***Comment:** The plan is administered by DPW and was last updated in 2014.*					
Stormwater Management Plan	Yes	Local and State	Yes	No	-
***Comment:** Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). The Plan is administered by the DPW and was last updated in 2008.*					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes	-
***Comment:** The Stormwater Pollution Prevention Plan is administered by DPW.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local/State	No	No	-
***Comment:** Administered by Planning.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local/State	No	No	-
Comment: *MLUL, Wayne Transit Zone Planning Area (2009).*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	Yes	-	No	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Housing Element and Fair Share Plan	Yes	Local	-	-	-
Comment: *Updated in 2010.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. The Township's EOP was last updated in 2015 and is administered by OEM.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	Yes	Yes	-
Comment: *A THIRA was completed for the Town Hall.*					
Post-Disaster Recovery Plan	Yes	Local	Yes	Yes	-
Comment: *Included in the EOP*					
Continuity of Operations Plan	Yes	Local	Yes	Yes	-
Comment: *Included in the EOP*					
Public Health Plan	Yes	Local	Yes	Yes	-
Comment: *Included in the EOP*					
Other	No	-	-	-	-
Comment:					

Table 9.15-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes; Planning and Engineering
Does your jurisdiction have the ability to track permits by hazard area?	Yes, building GIS mapping
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, GIS

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Wayne.

Table 9.15-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Township Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Planning Board
Open Space Board / Committee	Yes	Planning Board
Economic Development Commission / Committee	Yes	Mayor's Office
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, Emergency Notification Network, Social Media, Emergency Radio station, website, traffic advisory page on website, road closure portal. Crisis Go: Notification system for the town emergency responders and staff.
Maintenance program to reduce risk	Yes	DPW – stormwater maintenance, repair catch basins, maintain infrastructure
Mutual aid agreements	Yes	OEM/EOP
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Planner/Township Engineer/Director of DPW
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer/Building Official
Planners or engineers with an understanding of natural hazards	Yes	Township Planner/Township Engineer
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	DPW
Staff with education/knowledge/training in low impact development	Yes	DPW
Surveyor	Yes	Township Engineering Department
Stormwater engineer	Yes	Township Engineer
Personnel skilled or trained in GIS applications	Yes	Township Engineering Department

Staff/Personnel Resource	Available?	Department/Agency/Position
Local or state water quality professional	Yes	Township Engineer
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM/EOP
Grant writers	No	-
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Township of Wayne.

Table 9.15-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Wayne.

Table 9.15-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	OEM, Police, and Mayor all serve as Public Information Officers
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes, Flood Information Page
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Twitter, Facebook, Instagram
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes; TV station

Criterion	Response
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; Reverse 911, Emergency Notification Network, Social Media, Emergency Radio station, website, traffic advisory page on website, road closure portal, Crisis Go: Notification system for the town emergency responders and staff.

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Wayne.

Table 9.15-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	Class 7	August 2014 (entered CRS 10/1/91)
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	04/4Y	10/1/17
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	none	3/13/2012

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.15-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	High
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	High
Severe Winter Weather	High
Wildfire	Medium

Notes:

High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;

Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.15-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Public Works
Who is your floodplain administrator? (name, department/position)	Director of Public Works
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	2013
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Exceed, members of CRS program
When was the most recent Community Assistance Visit or Community Assistance Contact?	2019
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	Repetitive Loss Area Analysis
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No, very well trained
□ If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	Yes, Class 7 and interested in improving.
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Policies in force: 747 Insurance in force: $193,161,800 Premium in force: $1,554,943
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 6,213 Claims open or closed without payment: 758 Total payments for losses: $120,221,098
Do you maintain a list of properties that have been damaged by flooding?	Through CRS repetitive losses
Do you maintain a list of property owners interested in flood mitigation?	Yes

**According to FEMA statistics as of 9/30/2018*

9.15.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of Wayne made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Geographic Information Systems (GIS) & Maps:** The municipal website hosts a GIS and Maps page. A press release documenting how to view flood data is included.
- **Planning and Zoning Department:** The Planning and Zoning Department is the municipal office of the Planning Board and Zoning Board of Adjustment. As such it is responsible for the processing of applications for development, subdivision, site plan and variance. The duties and responsibilities of the department and the boards are governed by the Municipal Land Use Law, Chapter 291, Laws of New Jersey, 1975, and the Township ordinances Chapter 134, Zoning, and Planning & Development Regulations (the Land Development Ordinance). The Department works closely with other Township Departments such as Building, Engineering, Public Works, Health, Tax Assessor, Parks and Recreation, and Legal, as well as the Economic Development Commission. The offices of the Township Affordable Housing Administrator, the Community Development Block Grant Administrator, and the Housing Rehabilitation/Housing Improvement Program Coordinator are also located in the Planning and Zoning Department.
- **Master Plan:** The comprehensive Master Plan is the Planning Board's most important tool in guiding the physical environment. The Township of Wayne prepared its last comprehensive Master Plan revision in 1978 and adopted reexamination reports in 1982 and 1988. Also in 1988, a Master Plan Policy Report was prepared which recommended significant changes to the Master Plan and Zoning Ordinance. The 1988 Master Plan Reexamination Report confirmed the need for a revised Master Plan to reflect the recommendations set forth in the Master Plan Policy Report. These past planning documents have been reviewed in the preparation of the 1994 Wayne Township Master Plan. The Wayne Township Master Plan, which provides a framework for the future development, redevelopment and preservation of the Township was prepared in accordance with the requirements of the Municipal Land Use Law, Chapter 291, Laws of New Jersey, 1975. It includes a land use plan, circulation plan, community facilities plan, conservation plan, utility service plan and economic plan. The Land Use Plan provides the basis for the revised Zoning Map and Ordinance. Other components of the Master Plan are used to determine funding priorities for capital improvements for community facilities, transportation and utility systems. The Conservation Plan determines which lands should be protected or conserved. Finally, the Master Plan can be used as a guide to making decisions on individual development applications.
- Planning Board: The Planning Board was created by ordinance in 1945. All revisions, amendments and changes to the Zoning Ordinance are reviewed by this board, and recommendations are passed on to the Township Council. The Planning Board classifies and approves new subdivisions and gives final approval on all site plans. A public hearing is required by law before either a minor or major subdivision is approved. A performance bond is required of builders to guarantee satisfactory completion of improvements set forth by the Township Engineer. When the performance bond is satisfied, it converts to a 10% maintenance bond. The fee is refunded after a successful hearing before the Council and the property owners. The Planning Board has nine members: the mayor, one council member, one township official other than a council member, and six citizens appointed by the mayor and approved by the council. All members serve without compensation. The Town Planner, the Township Engineer and the Planning Board attorney attend all regular meetings.
- **Zoning Board of Adjustments:** The Zoning Board of Adjustment is a Board which has the power to modify the law but not change it. By statute a Zoning Board is a quasi-judicial body and is granted four separate powers:
    - To hear and decide appeals where it is alleged that there is an error in any order or decision of an administrative official based on enforcement of the zoning ordinance.
    - To hear and decide requests for special exceptions or for interpretation of the map or for decisions upon other special questions upon which the board is authorized to by this ordinance to pass.

- To grant variances (without impairing the intent or purpose of the zone plan and zoning ordinance) where the withholding of such will inflict hardship.
- To grant variances in particular cases and for special reasons to allow a structure or use in a district restricted against such use or structure.

The board is comprised of seven regular members and up to four alternate members. All members must be citizens of the Township. Members of the Board are appointed by the Township Council for staggered four-year terms; alternates are appointed for two-year terms. Members may hold no elective office or position under the municipality. All meetings of the Board are open to the public and its minutes and other records are filed in the Board's office as public record. All members serve without compensation. The Assistant Township Planner, the Director of Public Works and the Board attorney attend all regular meetings.

- **Housing Improvement Program:** The Wayne Township Housing Improvement Program is designed to provide funding opportunities for owners of substandard housing located in the Township so as to bring such housing up to code standards and provide safe and decent living quarters for low and moderate income households. The program is funded and complies with U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) regulations.
- **Office of Emergency Management:** The Wayne Township Office of Emergency Management is a stand alone component of the Municipal government. The office works closely with Federal, State, County and local agencies to assure the coordination of large scale events. It plans for, coordinates and directs operations at large scale civil emergencies that usually require the coordinated efforts of multiple components of municipal government, outside agencies and local volunteer groups. The Municipal Emergency Management Coordinator is responsible for the provision of leadership in the field of Emergency Management and is responsible for Emergency Management program administration and program development encompassing the four phases of Emergency Management--mitigation, preparedness, response and recovery. The Emergency Management organization is comprised of several Deputy Coordinators, a Public Information Officer, support staff, the Local Emergency Planning Council, and volunteers including the Community Emergency Response Team and Volunteers Active in Disasters (VOAD).
- **Flood Preparedness:** The municipal website hosts a flood preparedness page which includes educational information regarding flooding, flood zones, preparation, flood gauges, and flood insurance.
- **Historical Commission:** The Historical Commission's major functions are to uncover and preserve any material pertaining to the history of the community; cooperate with township officials in the preservation of records and archives of the township; and the preservation of historic buildings, monuments, and markers.
- **Department of Public Works:** The Department of Public Works is responsible for the operation and maintenance of the Township's extensive municipal infrastructure including roadways, traffic signals, street signage, storm drainage, snow removal, sanitary sewers, sewer treatment and drinking water supply and distribution. There are over 960 local Township streets, comprising more than 200 miles of infrastructure.
    - **Division of Water Pollution:** This Division operates and maintains the 13.5 million gallon per day Mountain View Wastewater Treatment Facility on Dey Road. This facility treats all sanitary wastes and includes primary settling tanks, equalization basins, aeration tanks, final settling tanks, chlorination/dechlorination facilities, sludge pumping and storage, and sludge truck loading facilities for off-site disposal. The plant has a complete laboratory for testing and monitoring the treatment process.
    - **Division of Engineering:** The Division of Engineering provides technical, engineering and surveying services to the Department of Public Works and its Divisions. This Division prepares plans and specifications for a variety of public works and other improvement projects, including the Township's annual Road Resurfacing and Sidewalk Replacement programs, and supervises and

inspects all work done. The Division also maintains and provides for public information maps, plans and specifications, surveys and other records as may be required on public property, public works and facilities owned or operated by the Township. The Engineering Division provides technical support to other Township Departments as needed in the form of survey, design, review and inspection of a variety of public works projects. The Division additionally reviews private development projects, provides review reports to the Board of Adjustment and the Planning Board, and inspects improvements constructed by developers intended to be turned over to the Township.

Opportunities for Future Integration

As this HMP update is implemented, the Township of Wayne will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The Township will continue to use the Hazard Mitigation Plan as a guide to updating the Master Plan.
- The Township will continue to review and revise Wayne Floodplain Management regulations and the Wayne Township Master Plan to meet NFIP standards and regulate land development as necessary.

9.15.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Township of Wayne's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.15-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.15-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6, 2018	DR-4368	Yes	A strong low pressure system developed along the Middle Atlantic coast during the morning of Wednesday, March 7, 2018. The low tracked along the coast through the early morning hours on Thursday, March 8, 2018. The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey.	The Township experienced tree damage from heavy snow. Roughly $1M in FEMA reimbursement for tree removal and overtime costs.

9.15.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following summarizes the hazards of greatest concern and risk to the Township of Wayne.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.15-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	11,782	100-year MRP Hurricane:	3,157	100-year MRP Hurricane:	$437,178	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	1,981	NEHRP D&E:	567	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$1,950,568	
						2,500-year MRP building damages/loss:	$28,497,719	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,595	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators and HVAC; thermal expansion and other impacts to infrastructure.		Low
		Population Below Poverty Level:	730					

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	272	1% annual chance	81	1% annual chance	$2,338,238	High
		0.2% annual chance	1,347	0.2% annual chance	185			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	12	Class A:	5	Class A:	$6,592,467	Moderate
		Class B:	142	Class B:	37	Class B:	$16,062,365	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	16	Number of buildings the hazard area:	11	Replacement cost value of buildings located in the hazard area:	$9,618,571	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Wayne.

- Number of repetitive loss (RL) properties: 352
- Number of severe repetitive loss (SRL) properties: 412
- Number of RL/SRL properties that have been mitigated: The Township has acquired approximately 300 flood prone properties. Eight properties have been acquired through CDBG-DR.

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.15-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Eagle Medical Services Incorporated*	EMS		X	
Emeritus at Wayne*	Senior		X	
Farmingdale Sewer Pump Station*	Sewer Collection	X	X	2020-Township of Wayne-005
Ice Skating Shelter	Park/Open Space	X	X	2020-Township of Wayne-005
Minnisink Sewer Pump Station*	Sewer Collection	X	X	2020-Township of Wayne-005
Mothers Park and Ride	Park and Ride	X	X	2020-Township of Wayne-005
Mountain View Sewer Pump Station*	Sewer Collection	X	X	2020-Township of Wayne-005
Mountain View-Wayne	Rail		X	
Mountainview Wastewater Treatment	Wastewater Treatment	X	X	2020-Township of Wayne-005
Park and Ride	Park and Ride		X	
Passaic County Farm	Farmland	X	X	2020-Township of Wayne-005
Passaic County Parks Dept. Office	Government	X	X	2020-Township of Wayne-005
Pompton Aquatic Park	Park/Open Space	X	X	2020-Township of Wayne-005
Rt. 23 Transit Center	Park and Ride	X	X	2020-Township of Wayne-005
Sheffield Sewer Pump Station*	Sewer Collection	X	X	2020-Township of Wayne-005
Wayne Twp Memorial FA – Substation*	EMS	X	X	2020-Township of Wayne-005
West Belt Water Booster Station*	Water Distribution	X	X	2020-Township of Wayne-005
Willowbrook Mall	Park and Ride	X	X	2020-Township of Wayne-005

**Identified lifeline*

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- Numerous houses are located in the floodway.
- Falling trees cause power outages.
- Westfeldt Pump Station lacks backup power.
- Lions Head Lake Dam needs to be reconstructed dam.
- Wayne Hills High School complex generator is outdated. In addition, several other remaining schools do not have an emergency generator at this time.
- The Township has numerous critical facilities located in the 100-year floodplain.
- The Township has a high number of repetitive loss and severe repetitive loss properties.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Wayne that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Wayne has significant exposure. Refer to Figures 9.15-1 and 9.15-2 at the end of this annex.

Hazard Ranking

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; and community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the Township of Wayne. The Township of Wayne has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community. The Township agreed with the calculated hazard rankings.

Table 9.15-14. Township of Wayne Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Medium	Medium	Medium	Medium	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Low	Medium	Medium	Medium	Medium	Low

9.15.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.15-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Wayne-1: Obtain backup power to ensure continuity of operations at critical facilities: 1.Wayne Valley High School Emergency Generator 2.Wayne Township DPW Facility Generator	Township	Complete		
Wayne-2: Increase the capacity of stormwater infrastructure	DPW	Complete		
Wayne-3: Use the Hazard Mitigation Plan as a guide to updating the Master Plan. Review and revise Wayne Floodplain Management regulations and the Wayne Township Master Plan to meet NFIP standards and regulate land development.	Planning/ Zoning	This action is in progress and considered a capability.		
Wayne-4:Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress). Phase 2: Work with the property owners to implement selected action based on available funding and local match availability. Currently identified projects: - Hoffmann Grove Acquisition – Demolition: The Township has received approximately $1,839,351 in CDBG-DR funds to acquire and demolish 17 homes to create parkland. - Buttonwood-	Engineering	In Progress; The Township actively supports the mitigation of vulnerable structures and this is considered a priority. Refer to new action 2020-Township of Wayne-002	X	2020-Township of Wayne-002

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Acquisition/Demolition: The Township has received approximately $160,649 in CDBG-DR funds to acquire and demolish two homes to complete the buyouts and finish the open space project. The land surrounding these two properties will be converted to parkland. - FMA Funding: $31,476,299.80 to acquire and demolish 114 homes.				
Wayne-5: Acquisition of floodprone properties in the Township: - Fayette Avenue - Old Wayne section	Engineering	In Progress; refer to new mitigation action 2020-Township of Wayne-002	X	2020-Township of Wayne-002

In addition to the above progress, the Township of Wayne identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Township has bought out approximately 300 flood prone properties.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Wayne participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Wayne participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.15-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Wayne would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the 4 FEMA mitigation action categories and the 6 CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does

not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.15-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Township of Wayne-001	Repair and Upgrade of Lionshead Lake Dam	Lionshead Lake Dam on Linden Road is in need of substantial repairs and upgrades to provide protection from dam failure. The Dam does not currently meet dam safety requirements.	The Township will complete installation of overspill protection, spillway upgrades and culvert lining at the Lionshead Lake Dam on Linden Road.	Existing	Dam Failure, Flood	1, 2	Township of Wayne Administration	HMGP, PDM, FMA	Dam failure avoided, meet safety requirements	$840,000	2 years	High	SIP	SP
2020-Township of Wayne-002	Mitigate flood-prone properties, including RL/SRL properties	The Township has repetitive loss properties and severe repetitive loss properties.	After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes	Existing	Flood, Severe Storm	1, 2	NFIP Floodplain Administrator, supported by homeowners	FEMA HMGP and FMA, local cost share by residents	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.	$10 Million	3 years	High	SIP	PP
2020-Township of Wayne-003	Generator at the Mountain View Waste Water Treatment Plant	The backup generator at the Mountain View Waste Water Treatment Plant is outdated. The	The project will include the removal and replacement of the existing generator and	Existing	All Hazards	2, 6	Township of Wayne Administration	FEMA HMGP and PDM, USDA Community	Ensures continuity of operations	$850,000	1 year	High	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		facility needs backup power to remain functional during hazard events.	associated electrical systems at the Township Waste Water Treatment Plant to provide emergency back-up power.					Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget						
2020-Township of Wayne-004	Repair and Upgrade of Barbour Pond Dam	Barbour Pond Dam is in need of substantial repairs and upgrades to provide protection from dam failure. The Dam does not currently meet dam safety requirements.	The Township will complete installation of overspill protection and downstream protection at the Barbour Pond Dam.	Existing	Dam, Failure, Flood	1, 2	Township of Wayne Administration	HMGP, PDM, FMA	Dam failure avoided, meet safety requirements	$800,000	2 years	High	SIP	SP
2020-Township of Wayne-005	Inventory of Flood Exposure of Critical Facilities	The Township has numerous critical facilities located in the 100-year floodplain.	Critical facilities that are not protected to the 500-year flood level will undergo feasibility assessments to determine appropriate flood protection actions and implement the most cost effective options	Existing	Flood	1, 2, 6	Engineering, Office of Emergency Management	HMGP, PDM, USDA Community Facilities Grant Program, Municipal budget	Protection of critical facilities and services	TBD by selected actions	5 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			as funding becomes available.											

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.15-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Township of Wayne-001	Repair and Upgrade of Lionshead Lake Dam	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Township of Wayne-002	Mitigate flood-prone properties, including RL/SRL properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Township of Wayne-003	Generator at the Mountain View Waste Water Treatment Plant	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Township of Wayne-004	Repair and Upgrade of Barbour Pond Dam	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Township of Wayne-005	Inventory of Flood Exposure of Critical Facilities	1	1	1	0	1	1	0	1	1	1	0	0	1	1	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.15-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms					2020-Township of Wayne-003			
Dam Failure					2020-Township of Wayne-003	2020-Township of Wayne-001, 2020-Township of Wayne-004		
Disease Outbreak					2020-Township of Wayne-003			
Drought					2020-Township of Wayne-003			
Earthquake					2020-Township of Wayne-003			
Extreme Temperature					2020-Township of Wayne-003			
Flood		2020-Township of Wayne-002, 2020-Township of Wayne-005			2020-Township of Wayne-003	2020-Township of Wayne-001, 2020-Township of Wayne-004		
Geological Hazards					2020-Township of Wayne-003			
Hazardous Substances					2020-Township of Wayne-003			
Infestation and Invasive Species								
Severe Weather		2020-Township of Wayne-002			2020-Township of Wayne-003			

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Severe Winter Weather					2020-Township of Wayne-003			
Wildfire					2020-Township of Wayne-003			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.15.9 Staff and Local Stakeholder Involvement in Annex Development

The Township of Wayne followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.15-19. Contributors to the Annex

Entity	Title	Method of Participation
Dan Daly	OEM Coordinator	Primary POC, provided impact data, attended plan participant meetings, contributed to the mitigation strategy
Neal Bellet	Business Administrator	Secondary POC
Heather Vitz-Del Rio, P.E.	Director of Public Works and Engineering	NFIP FPA, contributed to mitigation strategy
Joseph Albanese	Construction Official	Provided impact data
Heather McNamara	CFO/Finance	Reviewed annex
Christopher Kok	Land Use Planner	Reviewed annex
Robert Minarick	Fire Official	Reviewed annex

Figure 9.15-1. Township of Wayne Hazard Area Extent and Location Map 1

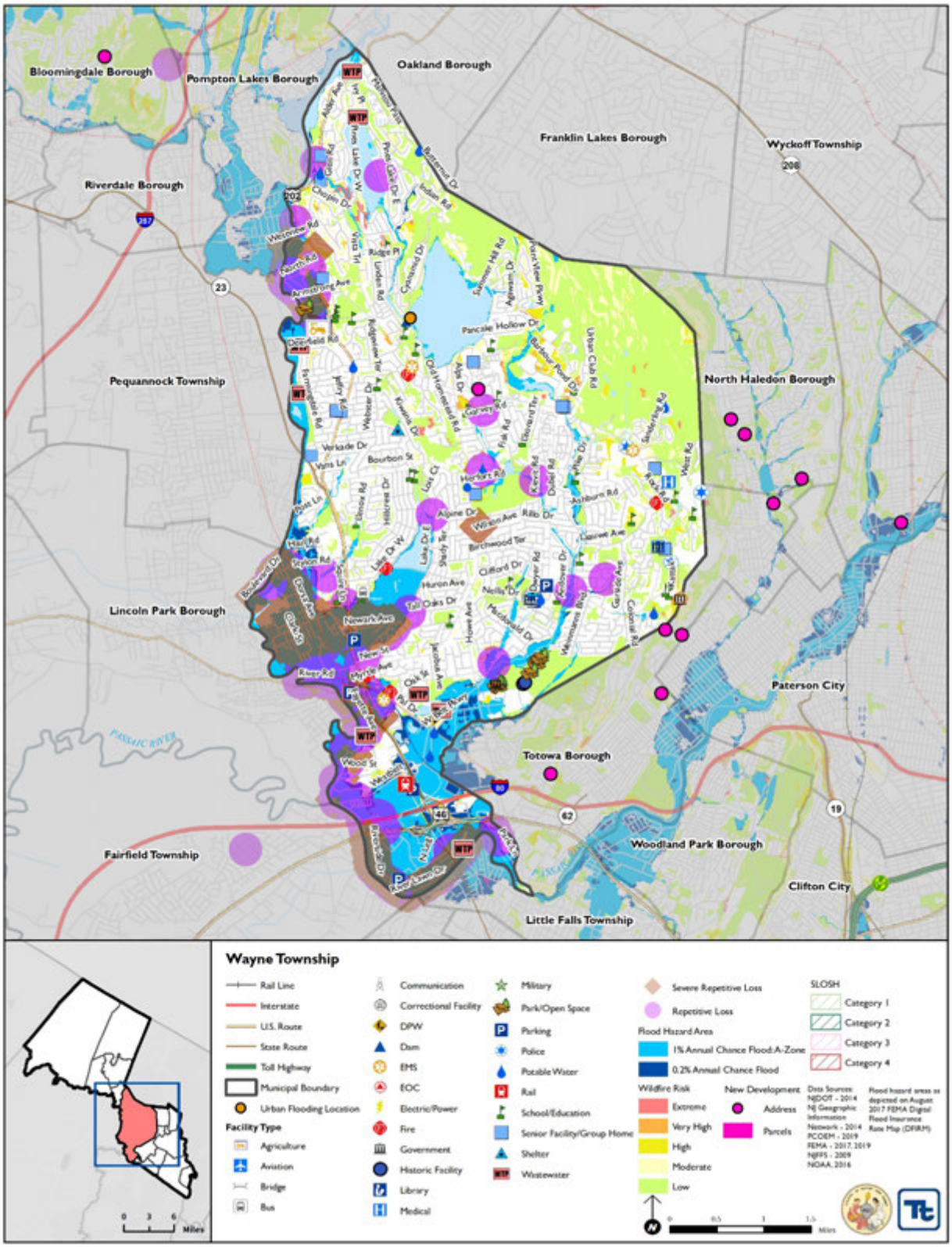
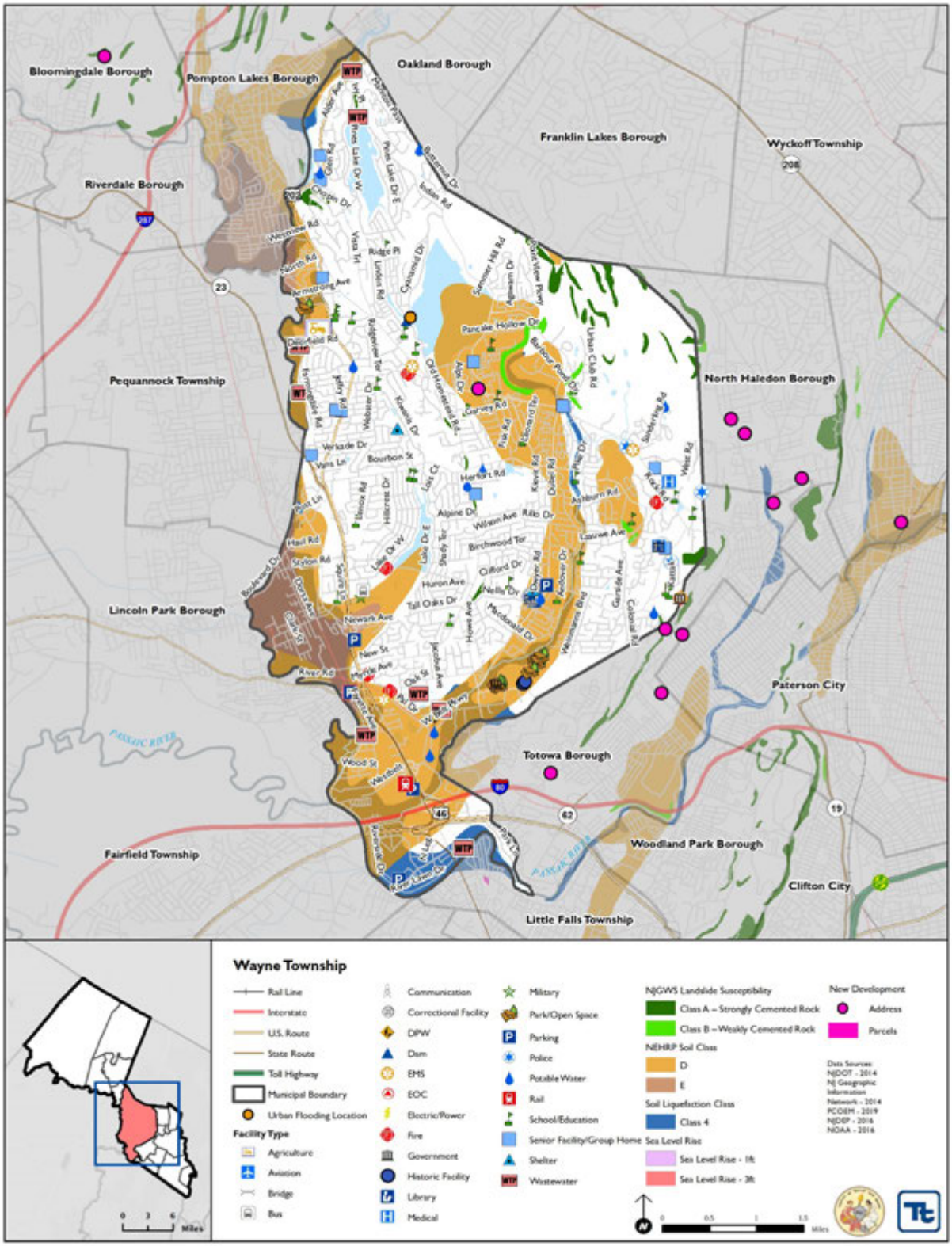


Figure 9.15-2. Township of Wayne Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	Repair and Upgrade of Lionshead Lake Dam		
Project Number:	2020-Township of Wayne-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Dam Failure, Flood		
Description of the Problem:	Lionshead Lake Dam on Linden Road is in need of substantial repairs and upgrades to provide protection from dam failure. The Dam does not currently meet dam safety requirements.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will complete installation of overspill protection, spillway upgrades and culvert lining at the Lionshead Lake Dam on Linden Road.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood	**Estimated Benefits (losses avoided):**	Dam failure avoided, meet safety requirements
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	$840,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	2 years	**Potential Funding Sources:**	HMGP, PDM, FMA
Responsible Organization:	Township of Wayne Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Repair Only	$100,000	Will not meet Dam Safety requirements
	Remove Dam	$1.5 million	Dam cannot be removed for safety reason.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repair and Upgrade of Lionshead Lake Dam	
Project Number:	2020-Township of Wayne-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects life from dam failure
Property Protection	1	Project protects property from dam failure
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support for the project
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Dam Failure, Flood
Timeline	0	1-2 years
Agency Champion	1	Township of Wayne Administration
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Township of Wayne-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the flood prone areas of the Township, focused along the Pompton River. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. The Township has 643 repetitive loss properties and 130 severe repetitive loss properties.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$10 Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Township of Wayne-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Town has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from Pompton River area of Township.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	3 years
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Generator at the Mountain View Waste Water Treatment Plant		
Project Number:	2020-Township of Wayne-003		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	The backup generator at the Mountain View Waste Water Treatment Plant is outdated (40 years old). The facility needs backup power to remain functional during hazard events.		
Action or Project Intended for Implementation			
Description of the Solution:	The project will include the removal and replacement of the existing generator and associated electrical systems at the Township Waste Water Treatment Plant to provide emergency back-up power.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	Backup power avoided	**Estimated Benefits (losses avoided):**	Ensures continuity of operations
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$850,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Immediately after funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Township of Wayne Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Repair/Upgrade existing Generator	$200,000	Inefficient 40 year old generator - unreliable
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generator at the Mountain View Waste Water Treatment Plant	
Project Number:	2020-Township of Wayne-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Mountain View Waste Water Treatment Plant
Property Protection	1	Project will protect Mountain View Waste Water Treatment Plant from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	1 year
Agency Champion	1	Township of Wayne Administration
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repair and Upgrade of Barbour Pond Dam		
Project Number:	2020-Township of Wayne-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Dam Failure, Flood		
Description of the Problem:	Barbour Pond Dam is in need of substantial repairs and upgrades to provide protection from dam failure. The Dam does not currently meet dam safety requirements.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will complete installation of overspill protection and downstream protection at the Barbour Pond Dam.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood	**Estimated Benefits (losses avoided):**	Dam failure avoided, meet safety requirements
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	$800,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	2 years	**Potential Funding Sources:**	HMGP, PDM, FMA
Responsible Organization:	Township of Wayne Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Repair Only	$100,000	Will not meet Dam Safety requirements
	Remove Dam	$1.5 million	Dam cannot be removed for safety reason.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repair and Upgrade of Barbour Pond Dam	
Project Number:	2020-Township of Wayne-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects life from dam failure
Property Protection	1	Project protects property from dam failure
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support for the project
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Dam Failure, Flood
Timeline	0	1-2 years
Agency Champion	1	Township of Wayne Administration
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Inventory of Flood Exposure of Critical Facilities		
Project Number:	2020-Township of Wayne-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The following critical facilities are located within the 100-year floodplain. (Critical facilities marked with a * have been identified as lifeline facilities): Farmingdale Sewer Pump Station*, Ice Skating Shelter, Minnisink Sewer Pump Station*, Mothers Park and Ride, Mountain View Sewer Pump Station*, Mountainview Wastewater Treatment, Passaic County Farm, Passaic County Parks Dept. Office, Pompton Aquatic Park, Rt. 23 Transit Center Park and Ride, Sheffield Sewer Pump Station*, Wayne Twp Memorial FA – Substation*, West Belt Water Booster Station*, Willowbrook Mall Park and Ride.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will complete a full inventory of the flood exposure and flood protections for each critical facility located in the 100-year floodplain. Critical facilities that are not protected to the 500-year flood level will undergo feasibility assessments to determine appropriate flood protection actions and implement the most cost effective options as funding becomes available.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood level.	**Estimated Benefits (losses avoided):**	Protection of critical facilities and services
Useful Life:	TBD by selected actions	**Goals Met:**	1, 2, 6
Estimated Cost:	TBD by selected actions	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, PDM, USDA Community Facilities Grant Program, Municipal budget
Responsible Organization:	Engineering, Office of Emergency Management	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Remove critical facilities located in floodplain	Determined by facility	Critical facilities cannot be relocated.
	Elevate all facilities	$200,000 per facility	Elevation for all may not be plausible/necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Inventory of Flood Exposure of Critical Facilities	
Project Number:	2020-Township of Wayne-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects critical services
Property Protection	1	Project protects critical facilities from flood damage
Cost-Effectiveness	1	
Technical	0	Project will require feasibility assessments
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	Project will require 5 years of time
Agency Champion	1	Office of Emergency Management
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.16 TOWNSHIP OF WEST MILFORD

This section presents the jurisdictional annex for the Township of West Milford. The annex includes a general overview of the Township; an assessment of the Township of West Milford's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.16.1 Hazard Mitigation Planning Team

The following individuals are the Township of West Milford's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.16-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Michael Moscatello / Deputy OEM Coordinator Address: 1480 Union Valley Road, West Milford, NJ Phone Number: 973-728-2827 Email: fireoffice2@westmilford.org	Name / Title: Edward Steines / OEM Coordinator and DPW Director Address: 1480 Union Valley Road, West Milford, NJ Phone Number: 973-728-2713 Email: firecomm@westmilford.org
NFIP Floodplain Administrator	
Name / Title: James Lupo / Zoning Officer Address: 1480 Union Valley Road, West Milford, NJ Phone Number: 973-728-2759 Email: zoning@westmilford.org	

9.16.2 Jurisdiction Profile

The Township of West Milford became an incorporated municipality in 1834 from Pompton Township, which was part of Bergen County at the time. In 1937, the Township was incorporated into Passaic County (Snyder, 1960).

West Milford is governed by the Mayor/Council/Administrator form of government under the Faulkner Act (Township of West Milford, 2014).

According to the U.S. Census Bureau, the Township has a total land area of 80.316 square miles, of which 75.09 square miles is land and 5.226 square miles is water.

According to the U.S. Census, the 2010 population for the Township of West Milford was 25,850. The estimated 2017 population was 26,759, a 3.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.1 percent of the population is 5 years of age or younger and 15.6 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.16.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. West Milford is one of only five municipalities in the Highlands Region located entirely in the Highlands Preservation Area. In the Preservation Area, the DEP's Highlands Water Protection and Planning Act Rules

(Rules), N.J.A.C. 7:38-1 et seq., establish the environmental standards and procedures by which the Department reviews any application pursuant to the Highlands Act. Some activities and projects, however, may be exempt. All "major Highlands development," as defined by the Highlands Act, in the Preservation Area is regulated and will require DEP approval, unless otherwise exempted by the Act.

The following table summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.16-1 and 9.16-2 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development.

Table 9.16-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018	2019
Number of Building Permits for New Construction Issued Since the Previous HMP						
Single Family	6	8	6	9	8	7
Multi-Family	-	-	-	-	-	
Other (commercial, mixed-use, etc.)	-	1 (commercial)	2 (commercial)	4 (commercial)	1 (commercial)	2 (commercial)

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
There is no new development anticipated at this time.					

** Only location-specific hazard zones or vulnerabilities identified.*

9.16.4 Capability Assessment

The Township of West Milford performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.16.4). The Township of West Milford identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Township of West Milford.

Table 9.16-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes		
Comment: Building Dept, State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.) *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019.*					
Zoning Code	Yes 5/16/1990	Local	Yes, because have planning board		
Comment: Building Dept, Township Ordinance Chapter 500 *State permissive on local level. [note local ordinance # and date of adoption]. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.*					
Subdivisions	Yes	Local	Yes, because have planning board		
Comment: Planning Board, Township Ordinance Chapter 470 *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.*					
Stormwater Management	6/29/2006	DPW			
Comment: DPW, Township Ordinance Chapter 325 *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8*					
Post-Disaster Recovery	No				
Comment:					
Real Estate Disclosure	Yes	State			
Comment: Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.					
Growth Management	No				
Comment: State Mandated on a municipal level. See Zoning Ordinance. Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.					
Site Plan Review	Yes 5/16/1990	Local	Yes because have Planning Board		
Comment: Township Ordinance Chapter 470 *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by county planning board and for the approval of those subdivisions affecting county road or drainage facilities. 40:27-6.10: Each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map.					
Environmental Protection	No				
Comment: The rules that are utilized by the NJ Department of Environmental Protection and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.					
Flood Damage Prevention	Yes, February 2020	Federal, State, Local	Yes		
Comment: Building Dept, Township Ordinance Chapter 158 *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance.*					
Wellhead Protection	Yes				
Comment: Delineation of well head protection areas (WHPAs) is part of the NJ-approved 1991 well head protection plan (WHPP) for public community water supply wells. These are priority areas for efforts to prevent and clean up ground water contamination. Municipalities are empowered to regulate land use, physical facilities and other activities within WHPAs areas, the potential for groundwater contamination can be reduced under the provisions of the New Jersey Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., which authorizes each municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents. Also refer to Safe Drinking Water Regulations (NJAC 7:10-11.7(b)1)). *The Township contains or lies within a number of wellhead protection areas.*					
Emergency Management	Yes				
Comment: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. See Emergency Operations Plans below.					
Climate Change	No				
Comment:					
Disaster Recovery Ordinance	No				
Comment:					
Disaster Reconstruction Ordinance	No				
Comment:					
Other					
Comment: • Municipal Separate Storm Sewer System (MS4), Township Ordinance Chap 325-2					
Planning Documents					
Comprehensive / Master Plan	Yes, Reexamination March 7, 2013; Land Use Plan Element December 7, 2017	Planning Board	Yes	Yes	
Comment: *Per NJSA: Yes, if planning board (40:55D-28) and must be re-examined every ten years (40:55D-89.1); County: Yes (40:27-2), Re-examination Report October 28, 2010* *Highlands Preservation Area Master Plan Element, Yes, September 27, 2012. This Plan Element further establishes the open space and environmental preservation goals and objects set forth in the Master Plan and Open Space Plan. In addition to the similar goals between the plans, this Plan Element also promotes the remediation and redevelopment of Brownfield sites where applicable, in place of new developments. The Element also addresses the preservation of the natural environment for stormwater and flood water retention and the difficulties with development on steep slopes and carbonate formations.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
The West Milford Planning Board adopted an Amendment to the Master Plan Land Use Element on October 28, 2010 with a limited focus to rezone a higher density residential district to a low-density density zone. *The Township's Master Plan Land Use Plan Element was updated in December 2017 as a basis for a thorough review and revision of the Township's zone plan and zoning ordinance. Objectives include:* • *Provide methods for reducing storm water runoff and its impact through best storm water management practices* • *Appropriately zone vacant land adjacent to open bodies of water for minimal development impact* • *Protect areas of high groundwater recharge value*					
Capital Improvement Plan	Yes	Local			
Comment: ID Long Term Capital Improvement Projects, part as annual budget *Per NJSA 40:55D-29) the governing body is authorized to direct the planning board to prepare a CIP with at least a six-year planning horizon.*					
Disaster Debris Management Plan	Yes	Local and County			
Comment: *EOP; The County is working on a Debris Management Plan (NJDEP is assisting with the County) for emergencies, County identifying stages areas for County and municipalities are identifying staging areas. NJDEP is determining if proposed staging areas are in the floodplain.*					
Floodplain or Watershed Plan	No				
Comment:					
Stormwater Management Plan	Yes, May 10, 2006	Local			
Comment: *DPW, Township Ordinance 325* *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).*					
Stormwater Pollution Prevention Plan	Yes, January 17, 2020	Local		Yes	
Comment: Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). *The plan describes long-term operation and maintenance measures for existing and future stormwater facilities. It also identifies specific stormwater management measures to decrease the impact of existing development. The goals of the plan include reducing flood damage, including life and property (same goal as the HMP); minimize any increase in stormwater runoff from new development; assure the adequacy of existing and proposed culverts and bridges and other in-stream structures. The plan indicates the Township inspects high-risk areas after every major rainstorm.*					
Urban Water Management Plan	No				
Comment:					
Habitat Conservation Plan	No				
Comment:					
Economic Development Plan	No				
Comment: Per NJSA 40:55D-28b. (9) There can be a generic Economic Development Element of the County Comprehensive Plan. Municipality can establish Economic Development Commission that can facilitate incentive programs (façade programs, low-interest loans, etc.)					
Shoreline Management Plan	No				

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: *Not applicable*					
Community Wildfire Protection Plan	No				
Comment: *All forest fire is handled by NJDEP Forest Fire Service in the Town*					
Community Forest Management Plan	No				
Comment: Optional accreditation for county and municipalities for reduction of liability, New Jersey Urban and Community Forestry Program (NJUCF). All forest fire is handled by NJDEP Forest Fire Service in the Town					
Transportation Plan	Yes	County			
Comment: May develop a circulation plan element in master plan per NJSA 40:55D-28b. (4).					
Agriculture Plan	No				
Comment: May develop a farmland preservation plan element per NJSA 40:5D-28b (13).					
Climate Action Plan	No				
Comment: May develop a green building and environmental sustainability plan element per NJSA 40:5D-28b (16).					
Tourism Plan	No				
Comment:					
Business Development Plan	Yes	County			
Comment:					
Other					
Comment: • *Open Space Plan, Yes, July 24, 2008* • *Stream Corridor Management Plan* • *The Highlands Master Plan Element and Highlands Environmental Resource Inventory (2012) provides an analysis of natural conditions including watersheds, topography, soil conditions, water supply, forested areas, critical habitats and water bodies in the Township.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local			
Comment: OEM, Emergency Operations Plan *Comment: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. The Township's EOP is dated 2019.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No				
Comment:					
Post-Disaster Recovery Plan	No				
Comment: ***Comment:*** *Part of EOP*					
Continuity of Operations Plan	No				
Comment: ***Comment:***					
Public Health Plan	Yes				
Comment: *Part of EOP annex*					
Other					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment:					

Table 9.16-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Building Department/ Planning Board/ZBA/ Environmental Commission/ Highlands Commission Approval
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, buildable land inventory (2009). Opportunity for future development is limited by environmental factors/Highlands

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of West Milford.

Table 9.16-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	No	
Economic Development Commission / Committee	Yes	Economic Development Commission
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, NIXEL, social media, local TV channel
Maintenance program to reduce risk	No	
Mutual aid agreements	Yes	Police, Fire, EMS, OEM
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	No	
Engineers or professionals trained in building or infrastructure construction practices	Yes	DPW Engineering

Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with an understanding of natural hazards	No	
Staff with training in benefit/cost analysis	No	
Staff with training in green infrastructure	No	
Staff with education/knowledge/training in low impact development	No	
Surveyor	No	
Stormwater engineer	Yes	Township Engineering
Personnel skilled or trained in GIS applications	Yes	Township using GIS for fire inspections/Engineer and IT
Local or state water quality professional	No	
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Municipal Emergency Management Coordinator
Watershed planner	No	
Environmental specialist	Yes	Contractors as needed for Environmental Commissions
Grant writers	No	
Resilience Officer	No	
Other		

Fiscal Capability

The table below summarizes financial resources available to the Township of West Milford.

Table 9.16-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	No
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of West Milford.

Table 9.16-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Handled within each department
Do you have personnel skilled or trained in website development?	IT Administrator
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes Links to FEMA flood maps/NJOEM
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes Facebook
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes Environmental Commission, Lakes Committee
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Nixle, Reverse911, Municipal Website, Social Media, local TV station
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Nothing in addition to the list

Community Classifications

The table below summarizes the classifications for community programs available to the Township of West Milford.

Table 9.16-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	3	03/2014
Public Protection (Fire ISO Protection Class)	Yes	6	
Storm Ready Certification	No		
Firewise Community Classification	No		
Sustainable Jersey	Yes	None to date	

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Criterion	Response
Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality?	No
Is the administrative supportive of integrating climate change in policies or actions?	Yes

Criterion	Response
Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?	No

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	Medium
Hazardous Materials	Medium
Disease Outbreak	Medium

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.16-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Zoning
Who is your floodplain administrator? (name, department/position)	James Lupo, Zoning Officer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	February 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meet
When was the most recent Community Assistance Visit or Community Assistance Contact?	October 20, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes, there is only one staff member as floodplain manager
□ If so, what type of assistance/training is needed?	Certified Floodplain Manager
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification?	No

Criterion	Response
• If no, is your jurisdiction interested in joining the CRS program?	
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	NFIP Policies: 17; WYO Policies: 83 Total coverage: $26,405,000
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	NFIP Claims 62; WYO claims: 59 $1,833,848 in paid claims
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of July 2019*

WYO = Write your own

9.16.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

Existing Integration

In the performance period since adoption of the 2015 HMP, the Township made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Flood Damage Prevention Ordinance (2020):** The Township's Flood Damage Prevention Ordinance was adopted for the revised floodplain mapping using the latest State ordinance template.
- **Land Use Plan Element (December 2017):** The Township's Master Plan Land Use Plan Element was updated in December 2017 as a basis for a thorough review and revision of the Township's zone plan and zoning ordinance. Objectives that include hazard mitigation include:
  - Provide methods for reducing storm water runoff and its impact through best storm water management practices
  - Appropriately zone vacant land adjacent to open bodies of water for minimal development impact
  - Protect areas of high groundwater recharge value
- **Master Plan Reexamination Report (2010):** This plan aims to allow for an increase in a balance of residential, commercial and industrial growth, while preserving the existing character and environmental quality and decreasing the impacts on air and water quality. A major stress is placed upon maintaining and expanding open spaces, protecting water resources and implementing sustainable land use and growth management strategies.

  In 2001, the Open Space Advisory Committee was formed to identify locations that would be suitable for open space preservation. The Open Space Plan in 2003 and subsequent revision in 2006 and 2008 identified many suitable sites and the characteristics of such sites. The Plan addressed the difficulty and hazard of developing on and near steep slopes, as well as the importance of maintaining forest cover as an effective means of flood control. These concepts were of the many that influenced the Master Plan Reexamination in 2010.
- The following mitigation actions were used or prosed as a means to achieve these goals:
  - Adopt a new Comprehensive Master Plan, land use regulations and environmental resource inventory

- Adopt Wastewater Management Plans that are consistent with the policies, goals and objectives of the Highlands Preservation Area
- Expand the Streetcapes Project
- Adoption of an Open Space Plan
- Evaluation of the Lakeside Residential Zone District
- $0.01 per $100 of assessed property value open space tax

- **Highlands Preservation Area Master Plan Element (2012):** This Plan Element further establishes the open space and environmental preservation goals and objects set forth in the Master Plan and Open Space Plan. In addition to the similar goals between the plans, this Plan Element also promotes the remediation and redevelopment of Brownfield sites where applicable, in place of new developments. The Element also addresses the preservation of the natural environment for stormwater and flood water retention and the difficulties with development on steep slopes and carbonate formations.
- **Stormwater Management Plan (2006):** The Township's Stormwater Management Plan addresses the potential risks due to increased stormwater runoff from major new developments and outlines design and performance standards for stormwater management. The goals of this plan include, reducing flood damage, soil erosion and nonpoint source pollution, maintain groundwater recharge and maintain the integrity of stream channels. The plan identifies the major waterways and waterbodies within the Township and also provides the name and location of proposed developments that can impact stormwater runoff.
  - Department of Public Works – continues to upgrade the storm basis and drains, rebuilding in-kind
  - Under NJDEP Storm Water Management rules, West Milford is required to maintain a Tier A Municipal Storm Water Permit. Their storm water outfall map is posted online with pipe locations within the MS4.
  - Stormwater facilities are mapped with a number identification system to assist in maintaining facilities and track efforts.
- **Stormwater Pollution Prevention Plan (last revised January 2020):** Details the best management practices maintained at the Township to stay in compliance with the Master General Permit for Tier A Municipal Separate Storm Sewer Systems (a.k.a., Tier A MS4 NJPDES Permit). This plan is posted online as well as their stormwater control ordinances. The Township inspects high-risk areas after every major rainstorm. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities. It also identifies specific stormwater management measures to decrease the impact of existing development. The goals of the plan include reducing flood damage, including life and property (same goal as the HMP); minimize any increase in stormwater runoff from new development; assure the adequacy of existing and proposed culverts and bridges and other in-stream structures.
- **Planning and Zoning Board:** The Township's planning and zoning boards review projects and ensure compliance before issuing preliminary or final subdivision or site plan approvals under the Municipal Land Use Law. All new residential development and redevelopment projects that are subject to the Residential Site Improvement Standards for stormwater management (including the NJDEP Stormwater Management rules, N.J.A.C. 7:8, referenced in those standards) are in compliance with those standards.
- **Ordinances:** The Township has its ordinances and flood protection measurements available on its website.
- **Outreach:**
  - The Township's website publishes news regarding public health advisories, municipal decisions and general community information.
  - The Office of Emergency Management has a Disaster & Emergency Info webpage that provides links to contact information, an emergency alert e-mail system, information on road closures, shelters and weather updates, and other general information.

- The Planning Department guides and handouts, plans and zoning board adjustments are posted on the website.
- The zoning map is posted on the website.
- There is a flyer posted that alerts the public regarding Emerald Ash Borer, Spotted Lanternfly and gypsy moth in the area.
- Public education and outreach is conducted as part of the Stormwater SWPP (i.e., flyer mailer; school presentations; community events; Township Environmental Committee holds information meetings with public on environmental topics

- **Funding:** The Department of Housing and Urban Development, NJDEP and Association of New Jersey Environmental Commissions provided grants in addition to the Township's open space tax that aided in the funding of mitigation projects and studies.
- **Maintenance:**
  - The Township inspects high-risk areas after every major rainstorm.
  - The Township has a sedimentation basin cleaning program; basins cleaned at minimum once per year (130 sedimentation basins).
  - The Township has an annual catch basin inspection program to maintain function and efficiency of approximately 4,000 catch basins; inspected once per year and inlets requiring cleaning are listed and cleaned whereas basins that are collapsed or in disrepair are high priority and are repaired/rebuilt.
  - Scouring sites are prioritized and repaired in accordance with soil erosion and sedimentation control in New Jersey. Riprap aprons were installed at 23 outfalls between 2005-2006 to prevent scouring.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the Township will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The Township has identified a new mitigation action to utilize the Hazard Mitigation Plan during the next Master Plan update. Refer to new mitigation action West Milford-10 below.

9.16.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Township of West Milford's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.16-10 provides details regarding municipal-specific loss and damages the Township of West Milford experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.16-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
May 14, 2017	Thunderstorms and Strong Wind	N/A	Strong thunderstorms struck over northeast New Jersey. Wind speeds between 40 and 50 mph were observed. In the City of Clifton, downed trees were reported, including one into a house on Ivy Drive.	Damages are related to downed trees leading to power outage and road closures
August 5, 2017	Thunderstorms and Flash Flooding	N/A	Showers and thunderstorms in the area led to isolated flash flooding in Passaic County. In the City of Clifton, US 46 was closed in both directions west of CR 625 and Randolph Ave. due to flooding.	Damages are related to downed trees leading to power outage and road closures
March 6-7, 2018	Severe Winter Storm and Snowstorm DR-4368	Yes	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands.	Damages are related to downed trees leading to power outage and road closures

N/A = Not applicable

9.16.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following table summarizes the Township's risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.16-11. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	26,759	100-year MRP Hurricane:	10,794	100-year MRP Hurricane:	$849,908	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	977	NEHRP D&E:	451	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year MRP building damages/loss:	$860,968	
						2,500-year MRP building damages/loss:	$17,203,549	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,150	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	1,311			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	273	1% annual chance	151	1% annual chance	$8,977,962	High
		0.2% annual chance	655	0.2% annual chance	474			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	72	Class A:	25	Class A:	$14,057,844	Moderate
		Class B:	121	Class B:	30	Class B:	$19,365,186	
		Carbonate Bedrock:	10,175	Carbonate Bedrock:	4,117	Carbonate Bedrock:	$3,063,309,095	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	246	Number of buildings the hazard area:	159	Replacement cost value of buildings located in the hazard area:	$430,046,369	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of West Milford.

- Number of repetitive loss (RL) properties: 10
- Number of severe repetitive loss (SRL) properties: 2
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.16-12. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
There are no critical facilities in the floodplain				

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- According to the 2007 Flood Insurance Study (FIS) for the Township of West Milford, the Township is subject to additional flooding from Belcher Creek and Morsetown Brook in the low-lying areas and at Union Valley Road in the vicinity. Low-lying areas adjacent to Longhouse Creek, Cooley Brook, Green Brook and Branches of Belcher Creek are also subject to flooding (FEMA FIS 2007).
- The 2006 Municipal Stormwater Management Plan for the Township of West Milford indicated that the Township exhibits water quantity problems, including flooding, erosion and diminished base flow. In the 1970s, the Township had 47 miles of unpaved roads that were subject to flooding. As of 2005, approximately 17 miles of unpaved, non-Township roads remain and are prone to flooding and/or erosion during periods of significant rainfall (Boswell Engineering 2006).
- There are carbonate areas subject to geologic hazards; however, a majority of carbonate area is not developed, protected by Highlands and in watershed protected/forested area.
- Cherry Ridge Road floods during heavy rain events increasing risk to residential area.
- Dams in the Township threaten life and property should there be a failure.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of West Milford that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of West Milford has significant exposure; refer to Figures 9.16-1 and 9.16-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Passaic County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Township of West Milford. The Township of West Milford has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Township of West Milford indicated the hazard ranking for the dam failure hazard should be changed from medium (2015) to high due to the multiple high hazard dams aging in the Township.

Table 9.16-13. Township of West Milford Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	High	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Medium	Medium	Medium	Medium

9.16.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.16-14. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Armor Lower Pond Dam at Bubbling Spring	Township Engineer	Reinforcement project at this dam, projected to complete in 2021	Yes, include in 2020 HMP	2020-West Milford-004
Stream bank stabilization of banks by High Crest Dam	Township Engineer	No Progress due to lack of funding – see Project Worksheet	Yes, include in 2020 HMP	2020-West Milford-002
Replace High Crest Drive Bridge at spillway	Township Engineer	No Progress due to funding – working on studies (1-2 years) because they just received a poor condition rating and the dam needs to be reconstructed; Town is working with the dam owner; bridge is under capital improvement and being discussed in budget	Yes, Include in 2020 HMP	2020-West Milford-002
Dredge Belcher Creek in part to relieve flooding of repetitive loss properties	Township Engineer	No Progress – combined with acquisition of floodprone properties action	Include in 2020 HMP as an acquisition project	2020-West Milford-003
Upgrade storm drainage system on Cherry Ridge Road	Township Engineer	This has not been completed; no available funding through capital budget. This is still needed. The roadway continues to flood due to heavy rain events and this is a residential area. Medium – (was a high) because capital funding may not be available for this project Engineering is the lead	Include in 2020 HMP	2020-West Milford-005
Public Warning Alert System	OEM	No Progress – siren with public address; terrain is spread out in West Milford and this can be removed due to increased capabilities with reverse 911/NIXLE/social media there are other communication avenues		
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Acquisition/Elevation of 50 flood prone properties located near Belchers Creek	OEM	No Progress – lack of funding but Township has not applied for funding; new administrator may result in progress moving forward	Include in 2020 HMP	2020-West Milford-003

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Determine properties at risk due to failures of Clinton Reservoir and Charlottesburg Dam and potential mitigation measures	OEM	No Progress -lack of funding	Include in 2020 HMP	2020-West Milford-001
Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance.	Elected Official's Office	Ongoing capability	No	
Utilize the HMP during the next Master Plan update	Borough	Township's Master Plan Land Use Plan Element was updated in December 2017 as a basis for a thorough review and revision of the Township's zone plan and zoning ordinance. This included best stormwater management and flood hazard integration.		

In addition to the above progress, the Township of West Milford identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- Revised the Stormwater Pollution Prevention Plan

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of West Milford participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of West Milford participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.16-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of West Milford would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.16-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-West Milford-001	Clinton Reservoir and Charlottesberg Dam Vulnerability Study	**Problem:** If there is a failure of the Clinton Reservoir and Charlottesberg Dam, there would be property damage and potential loss of life.	**Solution:** Perform a feasibility study to determine the vulnerability of properties in the dam inundation area as well as potential mitigation actions and implement the most cost-effective solution.	Both	Coastal Storm, Flood, Dam Failure, Severe Storm	1, 2	Township Emergency Manager	FEMA; Township	High	High	Short	High	SIP	PP
2020-West Milford-002	High Crest Dam Streambank Stabilization and Bridge Replacement	**Problem:** Bridge recently received a poor condition rating and the streambank is eroding; dam may need to be reconstructed. Town is working with the dam owner; bridge is under capital improvement and being discussed in budget. This is increasing potential for flooding of nearby structures.	**Solution:** Harden the bridge and implement streambank stabilization to reduce or eliminate the potential increased flooding.	Both	Coastal Storm, Flood, Severe Storm	2	Township Engineer	FEMA HMA; Capital budet	High	High	Short	Low	NSP	NR
2020-West Milford-003	Acquisition of floodprone properties near Belchers creek	**Problem:** Township has floodprone properties, of which some are repetitive loss properties including homes near Belcher's Creek that experience intermittent flooding.	**Solution:** Conduct outreach to flood-prone property owners, including RL/SRL property owners and in the vicinity of Belcher's Creek, and provide information on mitigation acquisitions. After interest is identified, collect required property-owner information and develop a FEMA grant application	Existing	Coastal Storm, Flood, Severe Storm	1, 2	NFIP Floodplain Administrator	FEMA HMA	High	High	Long	Low	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		and BCA to obtain funding to implement acquisition in the flood prone area that experience frequent flooding (high risk areas).												
2020-West Milford-004	Armor the Lower Pond Dam at Bubbling Springs	**Problem:** Lower Pond Dam at Bubbling Springs could fail and lead to life safety and flood issues.	**Solution:** Evaluate the current condition of the dam and determine what mitigation is needed to increase life/health/safety and property protection should there be a failure. Identify mitigation alternatives and apply for funding, if needed, to implement and harden the dam.	Both	Flood, Dam Failure, Severe Storm	1, 2, 4	Township Engineer	Township; FEMA HMA	High	High	Long	Low	SIP	PP
2020-West Milford-005	Upgrade storm drainage system on Cherry Ridge Road	**Problem:** There is insufficient drainage capacity of the system on Cherry Ridge Road causing flooding. There is no available funding through capital budget. The roadway continues to flood due to heavy rain events and this is a residential area.	**Solution:** Increase the capacity of the drainage system on Cherry Ridge Road to alleviate roadway flooding during heavy rain events	Both	Flood, Coastal Storm, Severe Storm	1, 2, 6	Township Engineer	FEMA HMA; Township for match	High	High	Short	Medium	SIP	PP
2020-West Milford-006	Install Generators at Critical Facilities and Lifelines	**Problem:** Critical facilities and lifelines need permanent generator to ensure continuity of operations in times of a disaster, including the Rec Center (formerly called the Hillcrest Building) which is the all-hazard shelter for the Township.	**Solution:** Install permanent generators at critical facilities and lifelines including the Rec Center (all-hazard shelter)	Existing	Coastal Storm, Earthquake, Extreme Temperature, Flood, Geological, Severe Weather, Severe	1, 2, 6	Township Engineer; Emergency Coordinator	Township; FEMA HMA	High	High	Short	High	SIP	PP, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
					Winter Storm, Wildfire									

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.16-16. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-West Milford-001	Clinton Reservoir and Charlottesberg Dam Vulnerability Study	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-West Milford-002	High Crest Dam Stabilization and Bridge Replacement	1	1	1	0	1	1	0	1	1	0	1	-1	0	1	8	Low
2020-West Milford-003	Acquisition of floodprone properties near Belchers creek	1	1	1	1	0	0	0	1	-1	1	1	-1	0	0	5	Low
2020-West Milford-004	Armor the Lower Pond Dam at Bubbling Springs	1	1	1	1	1	1	0	1	1	0	1	-1	0	1	9	Low
2020-West Milford-005	Upgrade storm drainage system on Cherry Ridge Road	1	1	1	1	1	1	0	0	1	1	1	0	0	1	10	Medium
2020-West Milford-006	Install Generators at Critical Facilities and Lifelines	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.16-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms		-001; -002; -003; -004		-002	-005, -006	-001; -002; -003; -004		
Dam Failure					-005, -006			
Disease Outbreak					-005, -006			
Drought					-005, -006			
Earthquake					-005, -006			
Extreme Temperature					-005, -006			
Flood		-001; -002; -003; -004		-002	-005, -006	-001; -002; -003; -004		
Geological Hazards					-005, -006			
Hazardous Substances					-005, -006			
Infestation and Invasive Species								
Severe Weather		-001; -002; -003; -004		-002	-005, -006	-001; -002; -003; -004		
Severe Winter Weather					-005, -006			
Wildfire					-005, -006			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.16.9 Staff and Local Stakeholder Involvement in Annex Development

The Township of West Milford followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.16-18. Contributors to the Annex

Entity	Title	Method of Participation
Michael Moscatello	Deputy OEM Coordinator and Fire Official	Primary point of contact, attended meetings, submitted worksheets, updated the annex
James Lupo	Zoning Officer and NFIP Floodplain Administrator	Provided information to update the annex

Entity	Title	Method of Participation
Edward Steines	OEM Coordinator and DPW Director	Reviewed the annex
Ellen Mageean	CFO/Finance	Reviewed the annex
Michele Dale	Mayor	Reviewed the annex
Bill Senande	Township Administrator	Reviewed the annex
James DeVore	Chief of Police	Reviewed the annex

Figure 9.16-1. Township of West Milford Hazard Area Extent and Location Map 1

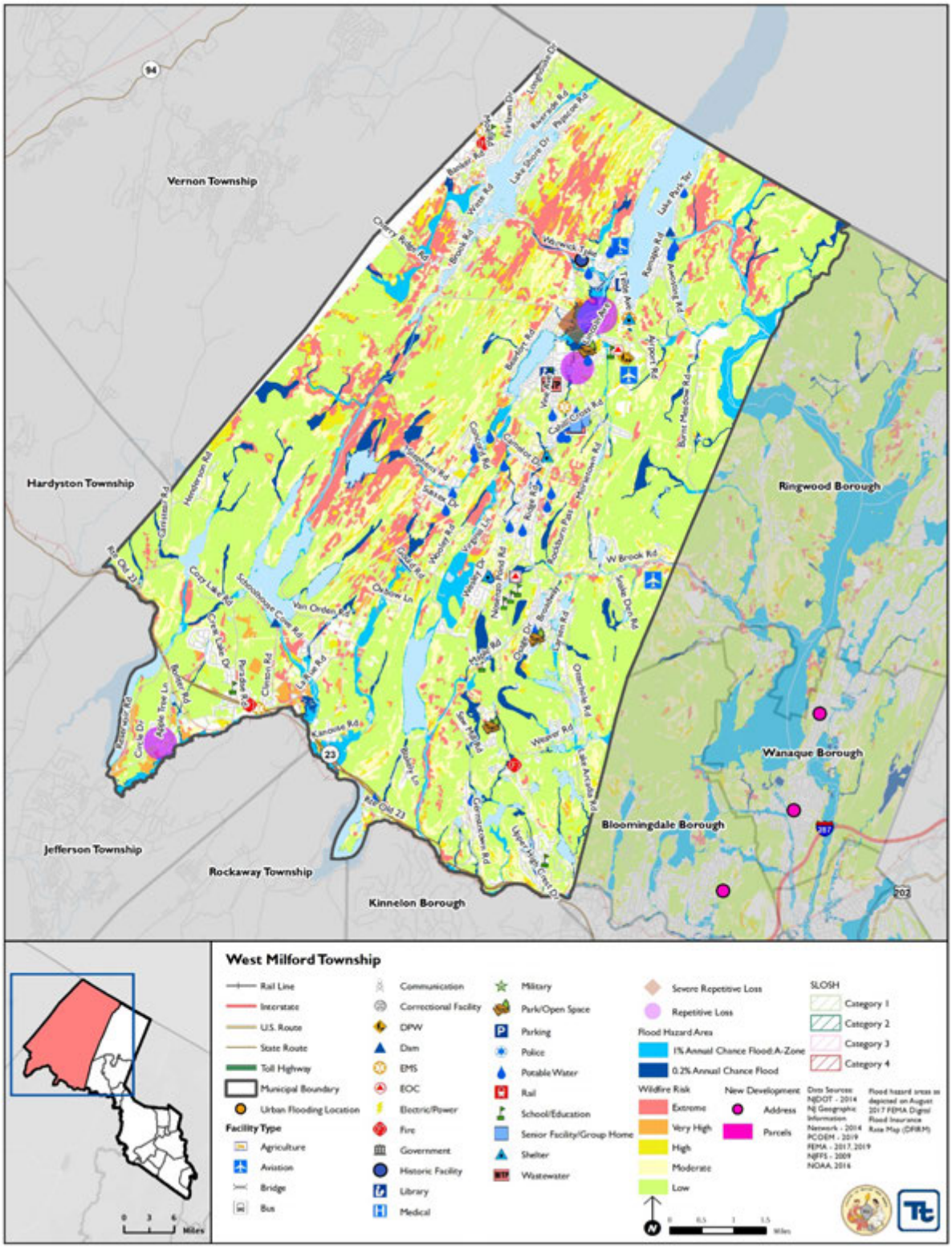
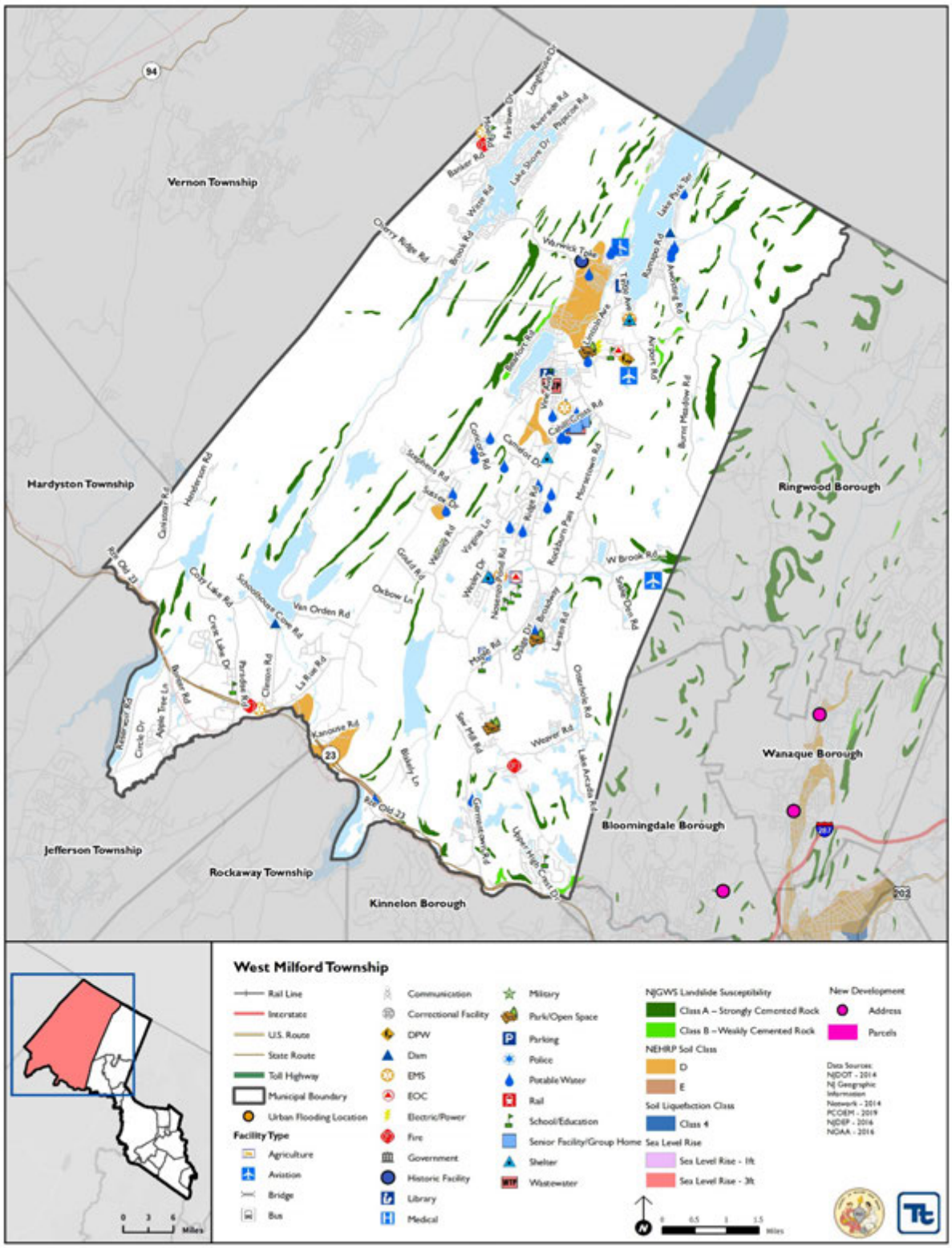


Figure 9.16-2. Township of West Milford Hazard Area Extent and Location Map 2



Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	Clinton Reservoir and Charlottesberg Dam Vulnerability Study		
Project Number:	2020-West Milford-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Flooding, property damage and loss of life potential in the event of dam failure		
Action or Project Intended for Implementation			
Description of the Solution:	Perform a feasibility study to determine the vulnerability of properties in the dam inundation area as well as potential mitigation actions and implement the most cost-effective solution.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; Life and safety; property protection
Useful Life:		**Goals Met:**	1, 2, 4
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	Municipal Budget; FEMA
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Floodplain Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Perform a feasibility study	High	Will determine the best alternative to reduce future impacts

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Clinton Reservoir and Charlottesberg Dam Vulnerability Study	
Project Number:	2020-West Milford-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	1	0
Social	1	No
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	High Crest Dam Streambank Stabilization and Bridge Replacement		
Project Number:	2020-West Milford-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Bridge recently received a poor condition rating and the streambank is eroding; dam may need to be reconstructed. Town is working with the dam owner; bridge is under capital improvement and being discussed in budget. This is increasing potential for flooding of nearby structures.		
Action or Project Intended for Implementation			
Description of the Solution:	Implement streambank stabilization to reduce or eliminate the potential increased flooding.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; reduce or eliminate environmental and structural impacts
Useful Life:	TBD	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	NSP
Plan for Implementation			
Prioritization:	Low	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	HMGP, HMA
Responsible Organization:	Township Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Floodplain Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Stream Diversion	High	Requires changing the stream channel to avoid impacting property; not feasible
	Streambank Stabilization	High	Stabilize streambank

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	High Crest Dam Streambank Stabilization and Bridge Replacement	
Project Number:	2020-West Milford-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	0	
Political	1	
Legal	1	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	
Timeline	-1	
Agency Champion	0	
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Low	

Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	Acquisition of floodprone properties near Belchers creek		
Project Number:	2020-West Milford-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Township has floodprone properties, of which some are repetitive loss properties including homes near Belcher's Creek that experience intermittent flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and in the vicinity of Belcher's Creek, and provide information on mitigation acquisitions. After interest is identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition in the flood prone area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:		**Estimated Benefits (losses avoided):**	High; eliminate future flood risk
Useful Life:	100 years (acquisition)	**Goals Met:**	1, 2
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	Low	**Desired Timeframe for Implementation:**	Long
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	HMGP, HMA, FMA
Responsible Organization:	Township Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Floodplain Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate or acquire properties	High	Elevating homes would not eliminate the problem and still lead to road closures and impassable roads; Acquisition would eliminate future impacts however both actions depend on agreement with property owners
	Dredge creek	High	Dredging the creek has several environmental and permitting hurdles and may not resolve the flooding.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Acquisition or elevation of floodprone properties near Belchers creek	
Project Number:	West Milford-3	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	1	
Environmental	1	
Social	-1	
Administrative	1	
Multi-Hazard	-1	
Timeline	-1	
Agency Champion	0	
Other Community Objectives	0	
Total	4	
Priority (High/Med/Low)	Low	

Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	Armor the Lower Pond Dam at Bubbling Springs		
Project Number:	2020-West Milford-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Dam Failure		
Description of the Problem:	Dam failure would lead to life safety and flood issues.		
Action or Project Intended for Implementation			
Description of the Solution:	Evaluate the current condition of the dam and determine what mitigation is needed to increase life/health/safety and property protection should there be a failure. Identify mitigation alternatives and apply for funding, if needed, to implement and harden the dam.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; Life/health/safety; property impacts
Useful Life:	TBD	**Goals Met:**	1, 2
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	Low	**Desired Timeframe for Implementation:**	Long
Estimated Time Required for Project Implementation:	Long	**Potential Funding Sources:**	HMGP, Capital Improvement Budget
Responsible Organization:	Township Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Floodplain Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Dam reconstruction	High	Build a completely new dam
	Harden dam	High	Evaluate current condition, identify feasible alternatives and implement

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Armor Lower Pond Dam at Bubbling Springs	
Project Number:	2020-West Milford-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	
Timeline	-1	
Agency Champion	0	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	Low	

Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	Upgrade drainage capacity		
Project Number:	2020-West Milford-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Coastal Storm, Severe Storm		
Description of the Problem:	There is insufficient drainage capacity of the stormwater system on Cherry Ridge Road causing roadway flooding and threatening property in a residential area during heavy rain events.		
Action or Project Intended for Implementation			
Description of the Solution:	Increase the stormwater system capacity on Cherry Ridge Road to alleviate flooding during heavy rain events.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; Life and safety; property protection
Useful Life:	30 years	**Goals Met:**	1, 2, 6
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	Municipal/capital Budget; FEMA
Responsible Organization:	Township Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Increase drainage capacity of the stormwater system		Will reduce roadway flooding and risk to residential properties
	Elevate the road		This may reduce roadway flooding but will not reduce flood risk to nearby residential area

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Upgrade drainage	
Project Number:	2020-West Milford-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	0	
Agency Champion	0	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	Medium	

Name and Title Completing Worksheet: Michael Moscatello, Deputy OEM Coordinator

Action Worksheet			
Project Name:	Install generators at critical facilities and lifelines		
Project Number:	2020-West Milford-006		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	Critical facilities and lifelines need permanent generators to ensure continuity of operations at the time of a disaster. This includes he Rec Center (formerly Hillcrest Building) which is the all-hazard shelter for the Township.		
Action or Project Intended for Implementation			
Description of the Solution:	Install a permanent generator at critical facilities and lifelines including the Rec Center (all-hazard shelter)		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	High; Life and safety; property protection
Useful Life:		**Goals Met:**	1, 2, 6
Estimated Cost:	High	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Short
Estimated Time Required for Project Implementation:	Short	**Potential Funding Sources:**	Municipal Budget; FEMA
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install generator		Will provide backup power when power outages occur
	Install a cogen		Will provide power but more expensive compared to a generator

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Install generators at critical facilities and lifelines	
Project Number:	2020-West Milford-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.17 BOROUGH OF WOODLAND PARK

This section presents the jurisdictional annex for the Borough of Woodland Park. The annex includes a general overview of the Borough of Woodland Park; an assessment of the Borough of Woodland Park's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.17.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Woodland Park's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.17-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: George Galbraith, Director/Woodland Park OEM Address: 5 Brophy Lane, Woodland Park, NJ 07424 Phone Number: 973-256-1264 Email: ggalbraith@wpnj.us	Name / Title: Kevin Galland, Administrator/Municipal Clerk Address: 5 Brophy Lane, Woodland Park, NJ 07424 Phone Number: 973-345-8100 x201 Email: kgalland@wpnj.us
NFIP Floodplain Administrator	
Name / Title: Allan Burghardt, Construction Code Official / Bldg Subcode Official / Bldg Inspector / Code Enforcement Officer Address: 5 Brophy Lane, Woodland Park, NJ 07424 Phone Number: 973-345-8100 x208 Email: aburghardt@wpnj.us	

9.17.2 Jurisdiction Profile

The area of Woodland Park was once the West Park section of the Township of Little Falls. In the early 1900's, residents in this section felt they were treated unfairly as compared residents in Little Falls. In 1914, the residents of West Park successfully became an independent municipality, West Paterson. In 2009, the Borough's name was changed to Woodland Park after nearly 20 years of residents pushing for the change (Borough of Woodland Park, 2014).

The Borough is governed under the Small Municipality Plan form of government under the Faulkner Act (Borough of Woodland Park, 2014). According to the U.S. Census Bureau, the Borough has a total land area of 3.115 square miles, of which 2.964 square miles is land and 0.151 square miles is water. Highway access is provided by Interstate 80 in the northern edge of town and U.S. 46 along the southern border. Natural features form the Borough's other two borders: Garret Mountain on the east and the Passaic River on the west (Borough of Woodland Park, 2014). According to the U.S. Census, the 2010 population for the Borough of Woodland Park was 11,819.

According to the U.S. Census, the 2010 population for the Borough of Woodland Park was 11,819. The estimated 2017 population was 12,542, a 6.1 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.4 percent of the population is 5 years of age or younger and 19.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.17.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.17-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figures 9.17-1 and 9.17-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.17-2. Recent and Expected Future Development

Type of Development	2015	2016	2017	2018	2019
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	13	6	2	1	0
Multi-Family	1	0	0	0	0
Other (commercial, mixed-use, etc.)	0	1	0	1	0
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
Since 2015 no major development					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Redevelopment is taking place in the Borough, not new development (i.e., open space to developed property).					
McBride Avenue near Lackawanna Ave, – existing building being taken down and smaller footprint being developed to new higher standards.	Restaurant, retail and commercial	1	McBride Avenue near Lackawanna Ave	No	NJDEP reviewed the plans and ok with increased greenspace, building demolition permit is granted yet but

** Only location-specific hazard zones or vulnerabilities identified.*

9.17.4 Capability Assessment

The Borough of Woodland Park performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that

mitigation is currently integrated are summarized in this section. The Borough of Woodland Park identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Woodland Park.

Table 9.17-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local/State	Yes	No	-
Comment: *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. The Construction Official and Department of Inspections enforces the UCC.*					
Zoning Code	Yes	Local	Yes	Yes	-
Comment: *Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. The Zoning Ordinance, Chapter 22 of the municipal code is administered by the Board of Adjustment. The Ordinance was last updated in 2017. For the purpose of limiting and restricting to specified districts, and regulating therein buildings and lands and structures according to their construction and the nature and extent of their use, and to regulate and restrict the height, number of stories, and size of buildings and other structures, the percentage of lot that may be occupied, the size of yards, courts and other open spaces, the density of population and the location and use and extent of use of lands, buildings and structures for trade, industry, residence of other purposes, the municipality is hereby divided into districts as hereafter set forth. The land use pattern as set forth is based upon the Land Use Element of the Master Plan and is intended to effectuate the Master Plan enacted in order to encourage municipal action to guide the appropriate development of land in a manner which will promote the public health, safety, morals and general welfare of the public.*					
Subdivisions	Yes	Local	Yes	No	-
Comment: *Chapter 297 of the Borough code. Planning and Zoning enforce the Subdivision Code. State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Subdivisions and Site Plan, Chapter 33 of the municipal code, is administered by the M&C/Planning Board. The purpose of the ordinance is to provide rules, regulations and standards to guide land subdivision in the municipality in order to promote the public health, safety, convenience and general welfare of the municipality. It is administered to insure the orderly growth and development, the conservation, protection and proper use of land and adequate provision for circulation, utilities, and services.*					
Stormwater Management	Yes	Local	Yes	No	-
Comment: *Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 29, the stormwater ordinance, is administered by the DPW. The purpose of the ordinance is to prohibit the spilling, dumping, or disposal of materials other than stormwater into the municipal separate storm sewer system (MS4) operated by the Borough of Woodland Park, so as to protect public health, safety and welfare, and to prescribe penalties for the failure to comply.*					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	Local	Yes	-	-
Comment: *State mandated at local level*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Shoreline Development	No	-	No	-	-
Comment:					
Site Plan Review	Yes	Local	Yes	No	-
Comment: *MLUL NJ 40:55d. Subdivisions and Site Plan, Chapter 33 of the municipal code is administered by the M&C/Planning Board.*					
Environmental Protection	Yes	State, County, and Local	Yes	No	-
Comment: *The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Environmental Regulations, Chapter 30 of the municipal code are administered by the Police Department.*					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
Comment*: The Flood Damage Prevention Ordinance, Chapter 28 of the municipal code, is administered by the Floodplain Administrator. It is the purpose of the ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed. Updated flood ordinance was adopted January 2020.* *a. To protect human life and health;* *b. To minimize expenditure of public money for costly flood control projects;* *c. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* *d. To minimize prolonged business interruptions;* *e. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* *f. To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* *g. To ensure that potential buyers are notified that property is in an area of special flood hazard; and* *h. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions."*					
Wellhead Protection	No	-	-	-	-
Comment: *This is under NJDEP and County Board of Health*					
Emergency Management	Yes	Local	-	No	-
Comment: *Refer to EOP (authorized by State 2017)*					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment: *Reconstruction must be done under current building code*					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local/State	Yes	Yes, refer to new action 2020-Woodland Park-015	
Comment: *January 9, 2012 Administered by Planning. The plan includes the following concepts related to hazard mitigation: Incorporate green building and site design techniques into the zoning ordinance to promote a sustainable environment; Promote a more compact mixed-use type of land use pattern in areas with existing infrastructure and density and preserve open space also to promote a sustainable environment; and Incorporate a green buildings and environmental sustainability element into the Master Plan. The Sustainability Element works to promote water conservation and efficiency throughout all sectors of the community; Use sustainable stormwater management techniques in site design to reduce stormwater runoff and control erosion; Provide all segments of the community with information on sustainability, climate change, and strategies for development.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Capital Improvement Plan	Yes	Local	Allowed	No	-
Comment: *Administered by the Local M&C/DPW.*					
Disaster Debris Management Plan	No		No	-	-
Comment: *This is in progress. Woodland Park has provided NJDEP the debris staging location 901 McBride Ave and under review.*					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local and State	Yes	No	-
Comment: *Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). The Plan is administered by the DPW. The goals of the plan are:* • *Reduce flood damage, including damage to life and property;* • *Minimize, to the extent practical, any increase in storm water runoff from any new development;* • *Reduce soil erosion from any development or construction project;* • *Assure the adequacy of existing and proposed culverts and bridges, and other instream structures;* • *Maintain groundwater recharge;* • *Prevent, to the greatest extent feasible, an increase in nonpoint pollution;* • *Maintain the integrity of stream channels for their biological functions, as well as for drainage;* • *Minimize pollutants in storm water runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water;* • *Protect public safety through the proper design and operation of storm water basins;* • *Meet with adjoining municipalities to cooperatively establish storm water control measures; and* • *Meet with the county to ascertain regional storm water planning goals and determine their impact on Woodland Park.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: *Available online in accordance with NJ DEP.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local/State	No	No	-
Comment: *The Circulation Plan is an element of the 2012 Master Plan and includes information on roads, passenger rail, bus service, accidents, mass transit, pedestrian and bike circulation. County has a plan in terms of senior transportation and roads upgraded.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: *Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. The EOP is administered by OEM. Last authorized by State in 2017.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	Local	Yes	Yes	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	Local	Yes	Yes	-
Comment: *Refer to EOP for continuity of government operations; not a stand-alone plan*					
Public Health Plan	Yes	Local	Yes	Yes	-
Comment: *Refer to EOP annex; Woodland Park is under the County's jurisdiction for public health*					
Other	No	-	-	-	-
Comment:					

Table 9.17-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes
Does your jurisdiction have the ability to track permits by hazard area?	Yes – permit paperwork indicates hazard
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, there is an inventory of open space; very few buildable lands in the Borough because 1/3 is Park and reservoirs

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Woodland Park.

Table 9.17-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Municipal Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Open Space Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, NIXLE, outdoor warning sirens in the flood zone, Cable TV access
Maintenance program to reduce risk	Yes	Permit issuance and plan review
Mutual aid agreements	Yes	OFM, M&C
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Municipal Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Municipal Engineer
Planners or engineers with an understanding of natural hazards	Yes	Municipal Engineer
Staff with training in benefit/cost analysis	Yes	Building Department/OEM
Staff with training in green infrastructure	Yes	Municipal Engineer
Staff with education/knowledge/training in low impact development	Yes	Municipal Engineer
Surveyor	Yes	Municipal Engineer
Stormwater engineer	Yes	Municipal Engineer
Personnel skilled or trained in GIS applications	Yes	County
Local or state water quality professional	Yes	Licensed Water Operator
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Grant writers	Yes	Administration
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	Contractor as needed
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of Woodland Park.

Table 9.17-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes

Financial Resource	Accessible or Eligible to Use?
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes, Borough has their own water and has water fees
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Woodland Park.

Table 9.17-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, IT and Police
Do you have personnel skilled or trained in website development?	Yes, IT
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes, flood
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, Facebook
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Flood Board
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Borough sends out mailings to residents quarterly regarding mitigation operations, information is available in the library and civic organizations regarding flooding
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Borough watches the flood elevations and the OEM coordinator notifies Police regarding evacuation, use reverse 911 and activate sirens

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Woodland Park.

Table 9.17-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	8	2015
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	TBD	2008
Public Protection (Fire ISO Protection Class)	Yes	Class 3	2010
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.17-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Medium
Disease Outbreak	Medium
Drought	High
Earthquake	Medium
Extreme Temperature	High
Flood	High
Geological Hazards	Medium
Hazardous Substances	Medium
Severe Weather	High
Severe Winter Weather	High
Wildfire	High

Notes:
High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;
Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.17-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Code Enforcement
Who is your floodplain administrator? (name, department/position)	Allan Burghardt
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	January 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	Scheduled for December 2020
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
□ If so, what type of assistance/training is needed?	
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	Yes, Class 8
How many flood insurance policies are in force in your jurisdiction?* • What is the insurance in force? • What is the premium in force?	Policies in force: 177 Insurance in force: $49,128,500 Premium in force: $418,476
How many total loss claims have been filed in your jurisdiction?* • How many claims are still open or were closed without payment? • What were the total payments for losses?	Total loss claims: 588 Claims open or closed without payment: 72 Total payments for losses: $9,788,008
Do you maintain a list of properties that have been damaged by flooding?	Yes, maintained by Code Enforcement
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of 9/30/2018*

9.17.5 Integration with Other Planning Initiatives

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated below.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- **Planning Board:** The Planning Board of Woodland Park is empowered to:
  - Make and adopt and, from time to time, amend the master plan for the physical development of the Borough;
  - Administer the provisions of the Land Subdivision and Site Plan Review ordinances of the Borough in accordance with their provisions and the Municipal Land Use Law;
  - Consider and report to the Municipal Council within 35 days after referral as to any proposed development regulation submitted to it, and pass upon other matters specifically referred to the Board by the Council;
  - When reviewing an application, grant approval of a subdivision site plan or conditional use to the same extent and subject to the same restrictions as the Board of Adjustment;
  - Give site plan review and approval in accord with standards set forth by state statute.
- The **Borough Master Plan** includes the following concepts related to hazard mitigation: Incorporate green building and site design techniques into the zoning ordinance to promote a sustainable environment; Promote a more compact mixed-use type of land use pattern in areas with existing infrastructure and density and preserve open space also to promote a sustainable environment; and Incorporate a green buildings and environmental sustainability element into the Master Plan. The

Sustainability Element works to promote water conservation and efficiency throughout all sectors of the community; Use sustainable stormwater management techniques in site design to reduce stormwater runoff and control erosion; Provide all segments of the community with information on sustainability, climate change, and strategies for development.

- **Board of Adjustment (Zoning Board):** The Board of Adjustment of Woodland Park is responsible for hearing and deciding appeals where errors are alleged in the enforcement of the zoning ordinance by a Borough official; hearing and deciding requests for interpretation of the zoning map or ordinance; granting a variance to allow a structure or use in a zoning district restricted against such structure or use, but only with the approval of at least two-thirds of the Board; and referring a zoning application to the Planning Board for a report.

  Prior to zoning and permitting changes, the Borough Engineer reviews the hazard mitigation plan and other hazard analyses to ensure consistent and compatible land use.
- **Board of Health:** The Board of Health consists of seven members and has the powers and duties provided in N.J.S.A. 26:3-1 et seq. (1972 Code § 2-22.7).
- **Open Space Committee:** The Open Space Committee is comprised of five members that review, prioritize, and make recommendations to the Mayor and Council on the funding of qualifying open space projects.
- **Regional Flood Board:** The Passaic Valley Flood Control Board is charged with the overall management of the surface water of the Passaic River and the Peckman River Basins. To do so, its members review potential acquisition, construction, financing, improvement, maintenance and operation of flood control facilities and make recommendations to the governing bodies of Little Falls Woodland Park and Totowa, along with other officials. Additionally, the Board shall jointly purchase, construct, improve, extend, enlarge or reconstruct flood control facilities on behalf of its member local units subject to the approval of the council or governing body of each of the member municipalities.
- **Community Emergency Response Team:** The Community Emergency Response Team (CERT) program helps train people to be better prepared to respond to emergency situations in their communities. When emergencies happen, CERT members can give critical support to first responders, provide immediate assistance to victims, and organize spontaneous volunteers at a disaster site. CERT members can also help with non-emergency projects that help improve the safety of the community. The CERT course is taught in the community by a trained team of first responders who have completed a CERT Train-the-Trainer course conducted by their state training office for emergency management, or FEMA's Emergency Management Institute (EMI). CERT training includes disaster preparedness, disaster fire suppression, basic disaster medical operations and light search and rescue operations.
- **CodeRed:** Woodland Park has implemented CodeRED, an emergency notification system that functions as a reverse 9-1-1 system. For example, in the event of a weather emergency, the CodeRED system will call your landline telephone to alert you to the emergency situation.
- **Department of Public Works:** The DPW is responsible for the maintenance of all municipal roads, including snow removal, traffic signs and traffic signals. In addition, the DPW maintains all municipal facilities, parks and vehicles, the storm water drainage system, sewage system, and the firebox alarm system.
  - Since Woodland Park operates its own Water Company, the DPW is charged with maintaining the water system in the sections of the Borough served by the municipally-owned water company. The Borough owns and maintains a 1-million gallon water tank located on Washington Drive. A second tank was added on Garret Mountain at the site of the Four Seasons At Great Notch community to serves as a back-up and to maintain water pressure during emergencies. The Department of Water Pollution Control, headed by the Superintendent of the DPW, is responsible for the sanitary sewer

system. So, it also falls upon the DPW to maintain the Borough's sanitary sewers. Sewage treatment is no longer done at a DPW facility. Instead, Woodland Park's sewage is carried to the Passaic Valley Sewage Commission's treatment plant in Newark by the same main that serves Little Falls and Totowa.

- The Borough adheres to the latest stormwater management policies through the State.

Opportunities for Future Integration

As this HMP update is implemented, the Borough of Pompton Lakes will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Passaic County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report.

9.17.6 Hazard Event History Specific to the Jurisdiction

Passaic County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Passaic County and its jurisdictions. The Borough of Woodland Park's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Passaic County. Table 9.17-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.17-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
March 6-7, 2018	Severe Winter Storm and Snowstorm	DR-4368	A strong low-pressure system developed along the Middle Atlantic coast during the morning of Wednesday, March 7, 2018. The low tracked along the coast through the early morning hours on Thursday, March 8, 2018. The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey.	The Borough was reimbursed for tree removal.
August 11, 2018	Flash Flood	No	A stalled stationary boundary within a very moist airmass provided a focusing mechanism for several rounds of heavy rain that resulted in widespread flash flooding across northeast New Jersey. The Caldwell, NJ ASOS recorded 4.92 inches of rain, and multiple other stations across northeast New Jersey received	Flooding from the Peckman River impacted the Party City and Best Buy shopping centers as well as the Planet Fitness gym in Woodland Park. Cars were underwater in the Best Buy parking lot. Overall, approximately 210 homes, 70 businesses, and 222 parked cars

Date(s) of Event	Event Type (disaster declaration if applicable)	Passaic County Designated?	Summary of Event	Summary of Local Damages and Losses
			between 2.5 inches and 4 inches of precipitation. The Little Falls area of Passaic County was particularly hard hit with rising water from the Peckman River.	were impacted by flooding in Woodland Park.

9.17.7 Jurisdiction-Specific Vulnerabilities and Hazard ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.17-12 summarizes the Borough of Woodland Park risk assessment results and data used to determine the hazard ranking.

In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

Table 9.17-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
Coastal Storm*	100-Year Mean Return Period Hurricane	100-year MRP Hurricane:	12,542	100-year MRP Hurricane:	3,473	100-year MRP Hurricane:	$821,475	High
Dam Failure	Partial or complete failure of a dam There are 155 dams in the County; 49 are high hazard according to NJDEP.	Population impacted is dependent on the location and capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of buildings impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Foodborne Illnesses, Infectious Disease (Influenza, Enterovirus D68, Hepatitis C, Measles, Ebola) MRSA	Population impacted is dependent on the disease and severity of the outbreak; in some cases, immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak.		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from surface water, reservoirs and unconfined groundwater sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts		Low
Earthquake*	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated	NEHRP D&E:	927	NEHRP D&E:	349	100-year MRP building damages/loss:	$0	High
	NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	Liquefaction Class 4:	43	Liquefaction Class 4:	17	500-year MRP building damages/loss:	$4,602,483	
						2,500-year MRP building damages/loss:	$69,401,268	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,472	Structural impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures; increased operational costs due to increased use of generators		Low

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy[a]		Certainty Factor
		Population Below Poverty Level:	778			and HVAC; thermal expansion and other impacts to infrastructure.		
Flood*	100- and 500-Year Mean Return Period Event	1% annual chance	1,029	1% annual chance	392	1% annual chance	$27,310,317	High
		0.2% annual chance	1,680	0.2% annual chance	1,007			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	62	Class A:	19	Class A:	$19,367,697	Moderate
		Class B:	0	Class B:	0	Class B:	$0	
		Carbonate Bedrock:	0	Carbonate Bedrock:	0	Carbonate Bedrock:	$0	
Hazardous Substance[b]	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation and Invasive Species	Infestation including. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Japanese Maplewood, Emerald Ash Borer, Harmful Algal Bloom	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather*	Severe Weather Event	Entire population exposed; the degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic impacts depend upon the degree of impact.		Low
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Population residing in the hazard area:	0	Number of buildings the hazard area:	1	Replacement cost value of buildings located in the hazard area:	$948,522	Moderate

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Woodland Park.

- Number of repetitive loss (RL) properties: 89
- Number of severe repetitive loss (SRL) properties: 11
- Number of RL/SRL properties that have been mitigated: This number is constantly being updated and is kept on file at the Code Enforcement offices. FEMA notes one property has been mitigated. Five (5) properties are recorded as being acquired through the CDBG-DR program.

Source: FEMA March 2019

Note: The number of SRL properties excludes RL properties. SRL property count only includes verified properties (SRL_Indicator = V).

Critical Facilities

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.17-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Beatrice Gilmore E.S.	School		X	
McBride Ave Pump Station	Wastewater Pump	X	X	2020-Woodland Park -01
Memorial Middle School	School/Shelter	X	X	2020-Woodland Park -02
Pulse Medical Transportation	EMS	X	X	Borough has no jurisdiction on this building; Borough sends out mailings of location along with map regarding flood risk; 2020-Woodland Park -03
Woodland Park FD – Pv Hose Company 2	Fire		X	Privately owned but Borough supplements their operations; 2020-Woodland Park -03
Woodland Park Youth Senior Center	Shelter	X	X	2020-Woodland Park -04; Borough owned; slab on grade foundation; may not be feasible to elevate due to the large footprint; water rises very fast so not feasible to set up flood walls

Additional Identified Vulnerabilities

The jurisdiction has identified the following vulnerabilities within their community:

- The Borough has numerous repetitive loss and severe repetitive loss properties
- The Borough has numerous critical facilities in the 100-year floodplain.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Woodland Park that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Woodland Park has significant exposure. Refer to Figures 9.17-1 and 9.17-2 at the end of this annex.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Morris County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Borough of Woodland Park. The Borough of Woodland Park has reviewed the Passaic County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

Table 9.17-14. Borough of Woodland Park Hazard Ranking Input

Coastal Storm	Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature
High	Medium	Medium	Medium	Low	Medium

Flood	Geological Hazard	Hazardous Substances	Infestation and Invasive Species	Severe Weather	Severe Winter Weather	Wildfire
High	Medium	Medium	Medium	Medium	Medium	Low

9.17.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.17-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Obtain backup power to ensure continuity of operations for critical facilities. The following have been identified to date:	OEM	Complete: -Charles Olbon School (shelter) – installed		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
- Charles Olbon School (shelter) - Youth and Senior Center (shelter) - Beatrice Gilmore School - Memorial School		- Youth and Senior Center (shelter) – installed -Beatrice Gilmore School – not proceeding because funding source from the Board of Education is not proceeding - Memorial School - not proceeding because funding source from the Board of Education proceeding		
Youth and Senior Center (shelter) – purchase/construct flood walls/berm	OEM	See Mitigation Strategy Table	X	2020-Woodland Park-004
School #1 located at 648 McBride Ave– upgrade the facilities as a future shelter to replace the Little Falls Shelter that the Borough use to utilize. Currently this building is leased out to a private entity and the Borough is looking to get it back into operations.	Woodland Park Board of Education	Discontinue; This site is no longer identified as a shelter		
Peckman River at McBride Ave bridge – remove gravity sewer main and replace with a pump station to increase conveyance capacity of Peckman River	Borough	In progress, being funded by FEMA	X	2020-Woodland Park-007
McBride Ave Pump Station – flood-proof the building with door dams, seal transformers	Borough	See Mitigation Strategy Table	X	2020-Borough of Woodland Park-001
Utilize the HMP to update the Master Plan	Borough	Master Plan Update is 2012; this is still needed	X	2020-Borough of Woodland Park-015
Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Three homes have been identified for acquisition/demolition through CDBG-DR and add to parkland.	Engineering	Develop a plan to systematically mitigate properties year to year; prioritize properties and implement by conducting outreach to property owners and applying for grant funding.	X - carry over but modify with prioritization plan	2020-Woodland Park-008
Relocate (480 students) from Memorial School (located in Zone A in floodplain) to School #1 during flood events (Construct)	Woodland Park Board of Education	Not feasible project other than to rebuild a new school outside the floodplain, or add onto another school No longer a priority of the current administration; remove		

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Develop site plans for temporary/Alt classrooms at School #1 property for students of Memorial School to be relocated to School 1 site during flood events.	Woodland Park Board of Education	Not feasible project other than to rebuild a new school outside the floodplain, or add onto another school No longer a priority of the current administration; remove		
Retrofit Municipal Building/Police/Tri-Town EOC (Woodland Park / Totowa / Little Falls) on 5 Brophy Lane with improved technology (wiring, equipment)	OEM	Completed; funded through local sources		
Clear waterways of snags, debris and shoals	DPW	Routine maintenance activity that the Borough takes care of		

In addition to the above progress, the Borough of Woodland Park identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- Borough cleans storm drains as part of routine maintenance and flood prevention
- The Borough, in cooperation with Little Falls, obtained a State grant to purchase an excavator and cleaned the Peckman River and tributaries regularly

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Woodland Park participated in a risk assessment workshop in January 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Woodland Park participated in a mitigation action workshop in February 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Passaic County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.17-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Woodland Park would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the

prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.17-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Woodland Park-001	McBride Ave Pump Station	**Problem:** McBride Ave Pump Station is located in the 1% annual chance floodplain. IT is the main pump station for the sanitary sewer system, capacity of 8MGD and is critical because if this goes down you have sanitary sewage released into the Borough. There is already backup power at this location.	**Solution:** Install door dams, caulking of all conduits, sealing transformers, elevate and waterproof adjacent transition collection structure.	Existing	Flood	2	DPW and Engineer	HMGP, Municipal budget	High	$200,000	Short	High	SIP	PP
2020-Woodland Park-002	Memorial Middle School floodproofing	**Problem:** Memorial Middle School, which serves as a shelter, is located in the floodplain; installed door dams to date but the mechanicals are located below grade and are vulnerable to flood. There is a small generator for emergency power only.	**Solution:** Raise mechanicals.	Existing	Flood	2	Engineer, Board of Ed, OEM	HMGP, Municipal budget	High	High	Short	High	SIP	PP
2020-Woodland Park - 003	Expanded outreach to private property owners	**Problem:** Property in the Borough that is not owned by the municipality that is located in the floodplain is not under their jurisdiction to mitigate.	**Solution:** The Borough will distribute quarterly mailings to flood-prone residents and shows them on a map– add mitigation options so they can evaluate a mitigation option and contact the Borough for implementation	All	Flood	1	Floodplain Administrator/CRS Coordinator	Municipal budget	High	Low	Within 1 year	High	EAP	PI
2020-Woodland Park - 004	Woodland Park Youth Center flood wall	**Problem:** Woodland Park Youth and Senior Center (Shelter) – impacted by flash flood events; Borough owned; slab on grade foundation; may not be feasible to elevate due to the large		Existing	Flood	1,2	Mayor and Council/OEM	FEMA HMA; Local match	High	High	Within 1	Medium	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		footprint; water rises very fast so not feasible to set up flood walls	**Solution:** Build a flood wall around the building								year			
2020-Woodland Park - 005	Peckman River Flood Tunnel	**Problem:** Heavy rainfall results in the Peckman River overflowing its banks.	**Solution:** The USACE will construct a double box diversion culvert, or tunnel structure to be built under roadways to divert floodwater from the Peckman River into the Passaic River.	New and Existing	Flood	1, 2	USACE, Township of Little Falls, Borough of Woodland Park	USACE	Reduction in flooding of neighborhood and businesses	$172 million	Within 3 years	High	SIP	SP
2020-Woodland Park - 006	McBride Avenue Stormwater Upgrades	**Problem:** Tributary surcharge backs up and causes roadway and private property flooding – this happens several times a year and from larger events	**Solution:** Increase capacity of culverts on McBride Ave	Existing	Flood	1, 2	Borough Administration and County Engineers	FEMA HMA	High	High	Within 5 years	High	SIP	SP
2020-Woodland Park - 007 (Previous Action)	Peckman River pump station	**Problem**: Currently restricting conveyance of the river and obstruction needs to be removed	**Solution**: Peckman River at McBride Ave bridge – remove gravity sewer main and replace with a pump station to increase conveyance capacity of Peckman River – *in progress*	Existing	Flood	1, 2	DPW and OEM	FEMA HMA	High	High $1.9 Million	Within 1 year	High	SIP	PP
2020-Woodland Park - 008	Support the mitigation of vulnerable structures via retrofit	**Problem:** Frequent flooding events have resulted in repetitive loss properties and severe repetitive loss properties.	**Solution:** Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide	Existing	Flood	1, 2	Administration and OEM, CRS Coordinator	FEMA HMGP and FMA, local cost share by residents	High	Low	Short	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		information on mitigation alternatives. Assist property owners in grant applications.												
2020-Woodland Park-009	Flood Cameras	**Problem:** Stream gauges in the Borough lag in reporting of current conditions. This prevents proper response to events. Some events also result in gauge failure.	**Solution:** The Borough will provide cameras on the Franciso Bridge, E. Main Street, Lackawanna Avenue, and Route 46 East and West Bridge and connect the live footage to the Police headquarters and the Borough website. This will be a collaborative effort with the Township of Little Falls.	New and Existing	Flood	1, 2, 3, 4	Police Department, Woodland Park OEM, Department of Public Works, Little Falls	Borough budget, private grant opportunities, PDM, FMA	Reduction in flood response requirements, Public information, quicker response to flooding	$10,000	Within 2 years	High	LPR, EAP	ES, PI
2020-Woodland Park-010	All Hazard Public Education and Outreach	**Problem:** There is no all-natural hazard public education and outreach program in the Borough	**Solution:** Develop an all hazards public education and outreach program for hazard mitigation and preparedness on natural hazard risk including information regarding flood insurance and flood issues.	Both	All	1, 2	NFIP Floodplain Administrator/CRS Coordinator	Borough	High	Low	Short	Medium	EAP	PI
2020-Woodland Park-011	Early Warning System	**Problem:** There is no automated early warning system in the Borough	**Solution:** Expand the early warning communication system in the Borough so that it is automated and does not require man-power to activate.	Both	All	1, 2	OEM	Borough	High	High	Short	High	EAP	ES, PP
2020-Woodland Park-012	Compile Hazard Loss Information	**Problem:** There is no standardized or structured record-keeping system to document hazard loss information including high water marks to inform		Both	Coastal Storm, Disease Outbreak,	1,2	CRS Coordinator/OEM	Borough	High – Assists with	Medium	Short	Medium	EAP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		residents of the hazard as well as support future mitigation grant applications.	**Solution:** Improve understanding of natural hazards and compile and archive flood loss information, record high water marks to promote flood hazard awareness.		Drought, Earthquake, Flood, Geological, Hazardous Materials, Infestation and Invasive Speices, Severe Weather, Severe Winter Weather, Wildfire				benefit quantification for future FEMA HMA grants; educates residents; improves CRS rating					
2020-Woodland Park - 013	Establish Local Funding Source	**Problem:** The Borough does not have the funding available to support an on-going mitigation program and to contribute to the local match of federal grant applications.	**Solution:** Develop a funding source to fund mitigation program on a yearly basis for municipal mitigation projects.	Both	Coastal Storm, Disease Outbreak, Drought, Earthquake, Flood, Geological, Hazardous Materials, Infestation and Invasive Speices, Severe Weather,	1,2	Mayor and Council	Borough		Medium	Short	Medium	EAP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
					Severe Winter Weather, Wildfire									
2020-Woodland Park - 014	Morris Canal Streambank Stabilization	**Problem:** The Morris Canal is susceptible to high flow rates and bank erosion.	**Solution:** Implement a streambank stabilization project using native plant species.	Both	Flood	1,2	DPW		High	High	Short	Medium	NSP	NR
2020-Woodland Park - 015	Update Master Plan and Integrate HMP	**Problem:** The Master Plan is dated 2012 and is due for an update. Needs to integrate the hazard mitigation plan further.	**Solution:** Utilize the HMP to update the Master Plan	N/A	Coastal Storm, Disease Outbreak, Drought, Earthquake, Flood, Geological, Hazardous Materials, Infestation and Invasive Speices, Severe Weather, Severe Winter Weather, Wildfire	1,2	Administration	Borough	High	Low	Short	Medium	LPR	PR

Notes:

Acronyms and Abbreviations:
CAV Community Assistance Visit
CRS Community Rating System

Potential FEMA HMA Funding Sources:
FMA Flood Mitigation Assistance Grant Program
HMGP Hazard Mitigation Grant Program

Timeline:
The time required for completion of the project upon implementation

DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*
PDM	*Pre-Disaster Mitigation Grant Program*

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.17-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Woodland Park -001	McBride Ave Pump Station	0	1	1	1	1	1	0	1	1	1	1	1	1	1	12	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Woodland Park -002	Memorial Middle School floodproofing	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Woodland Park -003	Expanded outreach to private property owners	1	1	1	1	1	1	0	0	1	1	1	1	1	1	13	High
2020-Woodland Park -004	Woodland Park Youth Center flood wall	0	1	1	1	1	1	0	0	1	1	0	0	1	0	9	Medium
2020-Woodland Park -005	Peckman River Flood Tunnel	1	1	1	1	1	1	1	1	1	1	0	0	1	1	12	High
2020-Woodland Park -006	McBride Avenue Stormwater Upgrades	0	1	1	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-Woodland Park -007	Peckman River pump station	0	1	1	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-Woodland Park -008	Support the mitigation of vulnerable structures via retrofit	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Woodland Park -009	Flood Cameras	1	1	1	1	1	1	0	0	1	1	0	1	1	1	11	High
2020-Woodland Park -010	All Hazard Public Education and Outreach	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	Medium
2020-Woodland Park-011	Early Warning System	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020-Woodland Park-012	Compile Hazard Loss Information	0	0	1	1	1	1	0	0	1	1	1	1	1	1	10	Medium

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Woodland Park-013	Establish Local Funding Source	0	0	0	0	1	1	0	0	1	1	1	1	1	1	8	Medium
2020-Woodland Park-014	Morris Canal Streambank Stabilization	0	1	1	1	0	0	0	1	0	1	1	1	1	1	9	Medium
2020-Woodland Park -015	Update Master Plan and Integrate HMP	0	0	1	1	1	1	0	0	1	1	1	1	1	1	10	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.

Table 9.17-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Storms	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Dam Failure	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Disease Outbreak	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Drought	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Earthquake	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Extreme Temperature	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Flood	2020-Woodland Park -015	2020-Woodland Park-001, 2020-Woodland Park-002, 2020-Woodland Park -004, 2020-Woodland Park -007, 2020-Woodland Park -008, 2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -003, 2020-Woodland Park -009, 2020-Woodland Park -010	2020-Woodland Park -014	2020-Woodland Park -009, 2020-Woodland Park -011	2020-Woodland Park -005, 2020-Woodland Park -006		
Geological Hazards	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Hazardous Substances	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Infestation and Invasive Species		2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013						
Severe Weather	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-	2020-Woodland Park -010		2020-Woodland Park -011			

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
		Woodland Park -013						
Severe Winter Weather	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			
Wildfire	2020-Woodland Park -015	2020-Woodland Park -011, 2020-Woodland Park -012, 2020-Woodland Park -013	2020-Woodland Park -010		2020-Woodland Park -011			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

RED = high ranked hazard
ORANGE = medium ranked hazard
YELLOW = low ranked hazard

9.17.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Woodland Park followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.17-19. Contributors to the Annex

Entity	Title	Method of Participation
George Galbraith	Director/Woodland Park OEM	Primary POC, attended plan participant meetings, provided impact data, contributed to mitigation strategy, reviewed draft
Kevin Galland	Administrator/Municipal Clerk	Secondary POC
Allan Burghardt	Construction Code Official / Bldg Subcode Official / Bldg Inspector / Code Enforcement Officer	NFIP Floodplain Administrator; reviewed the annex
Heather Barkenbush	CFO/Finance	Reviewed the annex
Keith Kazmark	Mayor	Reviewed the annex
Michael Muccio	Fire Official	Reviewed the annex
John Uzzalino	Police Official	Reviewed the annex

Figure 9.17-1. Borough of Woodland Park Hazard Area Extent and Location Map 1

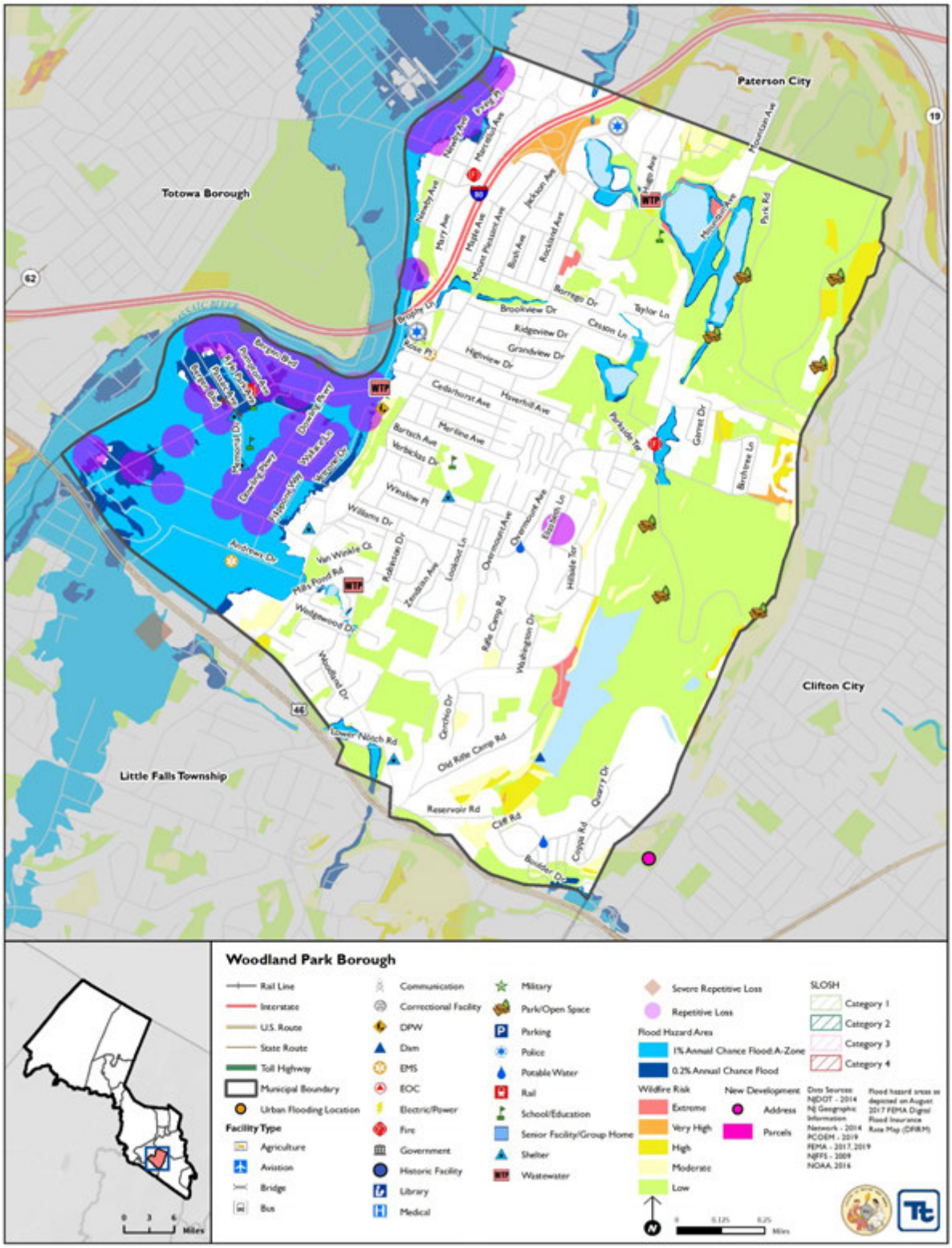
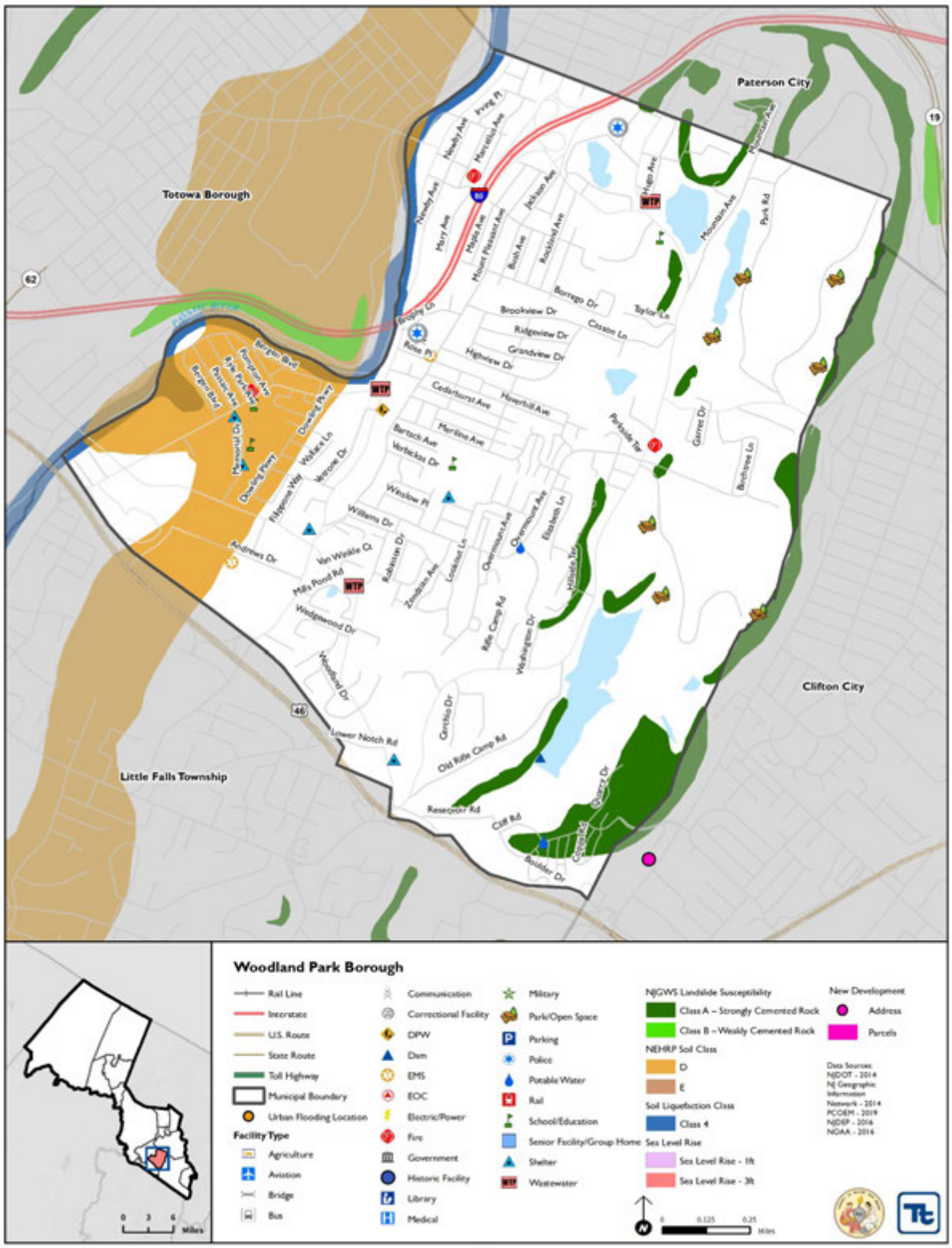


Figure 9.17-2. Borough of Woodland Park Hazard Area Extent and Location Map 2



Action Worksheet			
Project Name:	McBride Ave Pump Station		
Project Number:	2020- Woodland Park-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	McBride Ave Pump Station is located in the 1% annual chance floodplain. IT is the main pump station for the sanitary sewer system, capacity of 8MGD and is critical because if this goes down you have sanitary sewage released into the Borough. There is already backup power at this location.		
Action or Project Intended for Implementation			
Description of the Solution:	Install door dams, caulking of all conduits, sealing transformers, elevate and waterproof adjacent transition collection structure.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	1-percent plus 2 feet	**Estimated Benefits (losses avoided):**	Reduction in flood exposure to pump station
Useful Life:	50 years	**Goals Met:**	2
Estimated Cost:	$200,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, Municipal budget
Responsible Organization:	DPW and Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build new pump station uphill	$500,000	Too expensive
	Sandbags	$1,000	Requires deployment

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	McBride Ave Pump Station	
Project Number:	2020- Woodland Park-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protects pump station
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	2 years
Agency Champion	1	DPW and Engineer
Other Community Objectives	1	Protection of critical facilities
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Memorial Middle School floodproofing		
Project Number:	2020- Woodland Park-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Memorial Middle School, which serves as a shelter, is located in the floodplain; installed door dams to date but the mechanicals are located below grade and are vulnerable to flood. There is a small generator for emergency power only.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work with the school to raise mechanicals in the Memorial Middle School.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood level	**Estimated Benefits (losses avoided):**	Reduction in flood exposure to Memorial Middle School
Useful Life:	50 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, Municipal budget
Responsible Organization:	DPW and Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Relocate Middle School	$3 Million	Too expensive
	Sandbags	$1,000	Requires deployment

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet

Project Name:	Memorial Middle School floodproofing	
Project Number:	2020- Woodland Park-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protects mechanicals in Middle School
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	2 years
Agency Champion	1	DPW and Engineer
Other Community Objectives	1	Protection of critical facilities
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Woodland Park Youth Center flood wall		
Project Number:	2020-Woodland Park -004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Woodland Park Youth and Senior Center (Shelter) – impacted by flash flood events; Borough owned; slab on grade foundation; may not be feasible to elevate due to the large footprint; water rises very fast so not feasible to set up flood walls		
Action or Project Intended for Implementation			
Description of the Solution:	The Mayor and Council will oversee an action to build a flood wall around the Woodland Park Youth Center.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by flood wall design	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	Within 1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMA, Local match
Responsible Organization:	Mayor and Council	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate building	$3 million	May not be possible due to structure of the building, costly
	Relocate Youth Center	$3.5 million	Costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Woodland Park Youth Center flood wall	
Project Number:	2020-Woodland Park -004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	0	
Social	1	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	
Agency Champion	1	Mayor and Council
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet

Project Name:	Peckman River Flood Tunnel		
Project Number:	2020-Woodland Park -05		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Heavy rainfall results in the Peckman River overflowing its banks. Flooding impacts neighborhoods in Township of Little Falls and Borough of Woodland Park, including businesses.		
Action or Project Intended for Implementation			
Description of the Solution:	The USACE will construct a double box diversion culvert, or tunnel structure to be built under roadways to divert floodwater from the Peckman River into the Passaic River. Proposed project aspects include: • A 1,500-foot-long, 40-foot diameter double box diversion culvert would be constructed between the Peckman and Passaic rivers to divert floodwater from the Peckman into the Passaic River. • Approximately 2,170 linear feet of levees and/or floodwalls. • An additional 1,207 linear feet of levees and/or floodwalls would be constructed in the vicinity of Little Falls High School, between the track and baseball fields. • As many as 16 structures would be elevated so their main floor elevations would be to a final height of one foot above the base flood elevation. • As many as 38 structures to be wet floodproofed and four structures to be dry floodproofed.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	To be determined by completed project design	**Estimated Benefits (losses avoided):**	Reduction in flooding of neighborhood and businesses
Useful Life:	50 years	**Goals Met:**	1, 2
Estimated Cost:	$172 million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	USACE
Responsible Organization:	USACE, Township of Little Falls, Borough of Woodland Park	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Buyout all properties that could be impacted by flooding	$250,000 per property	Unlikely to buyout all properties
	Increase warning time by increasing warning systems	$50,000	Lives and property still at risk

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Peckman River Flood Tunnel	
Project Number:	2020-Woodland Park -05	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect lives from flooding
Property Protection	1	Project will protect homes and businesses from flooding
Cost-Effectiveness	1	
Technical	1	The USACE has developed plans for the project
Political	1	There is public support for the project
Legal	1	
Fiscal	1	The project could be supported by USACE funds
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	Within 3 years
Agency Champion	1	USACE, Township of Little Falls, Borough of Woodland Park
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Support the mitigation of vulnerable structures via retrofit		
Project Number:	2020-Woodland Park -008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in 91 repetitive loss properties and 6 severe repetitive loss properties.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$3Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Five years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, Engineering, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000 per home	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000 per quarter mile	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Support the mitigation of vulnerable structures via retrofit	
Project Number:	2020-Woodland Park -008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from areas of Borough where acquisitions are used.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Flood Cameras		
Project Number:	2020-Woodland Park -009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Stream gauges in the Borough lag in reporting of current conditions. This prevents proper response to events. Some events also result in gauge failure.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will provide cameras on the Franciso Bridge, E. Man Street, Lackawanna Avenue, and Route 46 East and West Bridge and connect the live footage to the Police headquarters and the Borough website. This will be a collaborative effort with the Township of Little Falls.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Reduction in flood response requirements, Public information, quicker response to flooding
Useful Life:	10 years	**Goals Met:**	1, 2, 3, 4
Estimated Cost:	$10,000	**Mitigation Action Type:**	Local Plans and Regulations, Education and Awareness Programs
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 month	**Potential Funding Sources:**	Borough budget, private grant opportunities, PDM, FMA
Responsible Organization:	Police Department, Woodland Park OEM, Department of Public Works, Little Falls	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning, Flood Warning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Post emergency staff at bridge	Staff time	Removes staffing capability elsewhere
	Increase resilience of stream gauges to prevent failure	$10,000	Still includes a lag in flood reporting

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Flood Cameras	
Project Number:	2020-Woodland Park -009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will result in less chance of flood exposure
Property Protection	1	Cameras will allow movable property to be moved as flooding begins (cars)
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	Within 2 years
Agency Champion	1	Police Department, Woodland Park OEM, Department of Public Works, Little Falls
Other Community Objectives	1	Community education
Total	11	
Priority (High/Med/Low)	High	

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ACRONYMS AND ABBREVIATIONS

%	Percent
ACOE	Army Corps of Engineers
ACS	American Community Survey
ADA	Americans with Disabilities Act
AICP	American Institute of Certified Planners
ANSS	Advanced National Seismic System
APA	Approval Pending Adoption
ARC	American Red Cross
ASCE	American Society of Civil Engineers
B	Borough
BCA	Benefit Cost Analysis
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BOCA	Building Officials Code Administration
CAV	Community Assistance Visit
CDBG	Community Development Block Grant
CDBG-DR	Community Development Block Grant Disaster Recovery
CDC	Centers for Disease Control and Prevention
CDMS	Comprehensive Data Management System
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan

COOP/COG	Continuity of Operations/Continuity of Government
CPC	Climate Prediction Center
CRS	Community Rating System
DFIRM	Digital Flood Insurance Rate Map
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DOT	Department of Transportation
DPW	Department of Public Works
DR	Major Disaster Declaration (FEMA)
EF	Enhanced Fujita Scale
EM	Emergency Declaration (FEMA)
EM	Emergency Management
EMS	Emergency Medical Services
EOC	Emergency Operation Center
EOP	Emergency Operation Plan
EPA	Environmental Protection Agency
ESF	Emergency Support Function
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIA	Flood Insurance Administration
FIS	Flood Insurance Study

FMA	Flood Mitigation Assistance
FPA	Floodplain Administrator
FY	Fiscal Year
GIS	Geographic Information System
HAZMAT	Hazardous Materials
HAZUS	Hazards U.S.
HAZUS-MH	Hazards U.S. Multi-Hazard
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUC	Hydrologic Unit
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
I	Interstate
IA	Individual Assistance
ICS	National Incident Command System
ISO	Insurance Service Organization
IT	Information Technology
LEPC	Local Emergency Planning Committee
LOMR	Letter of Map Revision
LOIP	Letter of Intent to Participate
MGD	Million Gallons per Day
Mi	Mile

MMI	Modified Mercalli Intensity Scale
Mph	Miles per Hour
MRP	Mean Return Period
N/A	Not Applicable
NA	Not Available
NASA	National Aeronautics and Space Administration
NCDC	National Climate Data Center
NCEI	National Centers for Environmental Information
NDMC	National Drought Mitigation Center
NEHRP	National Earthquake Hazard Reductions Program
NESIS	Northeast Snowfall Impact Scale
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NGVD	National Geodetic Vertical Datum
NHC	National Hurricane Center
NID	National Inventory of Dams
NIMS	National Incident Management System
NJ	New Jersey
NJDEP	New Jersey Department of Environmental Protection
NJGS	New Jersey Geological Survey
NJOEM	New Jersey Office of Emergency Management
NJTPA	North Jersey Transportation Planning Authority
NOAA	National Oceanic and Atmospheric Administration

NPDP	National Performance of Dams Program
NRCC	Northeast Regional Climate Center
NRCS	Natural Resources Conservation Service
NSIDC	National Snow and Ice Data Center
NSSL	National Severe Storms Library
NWIS	National Water Information System
NWS	National Weather Service
OEM	Office of Emergency Management
ONJSC	Office of the New Jersey State Climatologist
PA	Public Assistance
PCII	Protected Critical Infrastructure Information
PDM	Pre-Disaster Mitigation Program
PDSI	Palmer Drought Severity Index
PE	Professional Engineer
PGA	Peak Ground Acceleration
POC	Point of Contact
RCV	Replacement Cost Value
RL	Repetitive Loss
RSI	Regional Snowfall Index
RTE	Route
SBA	Small Business Administration
SC	Steering Committee
SF	Square Feet

SFHA	Special Flood Hazard Area
SPC	Storm Prediction Center
Sq. Mi.	Square mile
SRL	Severe Repetitive Loss
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
SWMP	Storm Water Management Plan
SWOO	Strengths, Weaknesses, Obstacles and Opportunities
T	Township or Town
TBD	To Be Determined
TS	Tropical Storm
UASI	Urban Areas Security Initiative
USACE	U.S. Army Corps of Engineers
USD	U.S. Dollar
USDA	U.S. Department of Agriculture
USDM	U.S. Drought Monitor
USDOT	U.S. Department of Transportation
USEDA	U.S. Economic Development Administration
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
VA	Vulnerability Assessment
WMA	Watershed Management Area

WUI	Wildland Urban Interface

APPENDIX A. PLAN ADOPTION

Federal Emergency Management Agency (FEMA) Approval Pending Adoption (APA) was granted on October 23, 2020. The Passaic County and municipal adoption resolutions are included in this appendix. Please refer to Section 8 (Planning Partnership) for additional information on plan adoption procedures.

Passaic County Board of Chosen Freeholders

OFFICE OF THE
PASSAIC COUNTY FREEHOLDERS

Director Cassandra "Sandi" Lazzara
Deputy Dir. Pasquale "Pat" Lepore
Assad R. Akhter
John W. Bartlett
Theodore O. Best, Jr.
Terry Duffy
Bruce James

401 Grand Street
Paterson, New Jersey 07505
Tel: 973-881-4402
Fax: 973-742-3746

Anthony J. De Nova III
Administrator
Matthew P. Jordan, Esq.
County Counsel
Louis E. Imhof, III, RMC
Clerk Of The Board

Public Meeting (Board Meeting)

Date: Nov 16, 2020 - 5:30 PM

Location: County Administration Building
220 - via Webex
401 Grand Street
Paterson, NJ 07505

Agenda: RESOLUTION AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY NEW JERSEY HAZARD MITIGATION PLAN UPDATE), ALL AS NOTED IN THE RESOLUTION.

THIS RESOLUTION WAS REQUESTED BY:

REVIEWED BY:

Anthony J. De Nova III
COUNTY ADMINISTRATOR

APPROVED AS TO FORM AND LEGALITY:

Matthew P. Jordan, Esq.
COUNTY COUNSEL

Law and Public Safety
COMMITTEE NAME

Official Resolution#	**R20201028**							
Meeting Date	11/16/2020							
Introduced Date	11/16/2020							
Adopted Date	11/16/2020							
Agenda Item	k-95							
CAF #								
Purchase Req. #								
Result	Adopted							
FREEHOLDER	PRES.	ABS.	MOVE	SEC.	AYE	NAY	ABST.	RECU.
Lazzara	✓				✓			
Lepore	✓			✓	✓			
Akhter	✓				✓			
Bartlett	✓				✓			
Best Jr.	✓				✓			
Duffy	✓				✓			
James	✓		✓		✓			

PRES.= present ABS.= absent
MOVE= moved SEC= seconded
AYE= yes NAY= no ABST.= abstain
RECU.= recuse

Dated: November 18, 2020

RESOLUTION AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards which increase the risk to life, property, environment. And the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the Disaster Mitigation Act of 2000 (P.L. 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHERAS, a coalition of Passaic County municipalities with like planning objectives has been formed in an effort to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process and found a plan that: engages the public, assesses the risk and vulnerability to the impacts of natural hazard; develops a mitigation strategy consistent with a set of uniform goals and objective; and addresses the implementation, evaluation and revising of this strategy; and

WHEREAS, this matter was brought before the Law and Public Safety Committee at its November 10, 2020 meeting and is now being recommended to the full board;

NOW, THEREFORE, LET IT BE RESOLVED, that the County of Passaic Board of Chosen Freeholders:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

LET IT BE FURTHER RESOLVED, that the Clerk to the Board, County Counsel, and Director of the Passaic County Board of Chosen Freeholders are authorized to take any other steps necessary to carry out the purpose of this resolution.

LSP

November 16, 2020

Introduced on: November 16, 2020
Adopted on: November 16, 2020
Official Resolution#: R20201028

RESOLUTION NO. 2020-11.7
OF THE GOVERNING BODY OF
THE BOROUGH OF BLOOMINGDALE

AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of Bloomingdale:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

Record of Council Vote on Passage

COUNCIL PERSON	AYE	NAY	Abstain	Absent	COUNCIL PERSON	AYE	NAY	Abstain	Absent
D'Amato	X				Juhlin	X			
Dellaripa	X				Sondermeyer	X			
Hudson				X	Yazdi	X			

I hereby certify that the foregoing is a true copy of a Resolution adopted by the Governing Body of the Borough of Bloomingdale at an Official Meeting held on November 6, 2020.

Breeanna Calabro, R.M.C.
Municipal Clerk, Borough of Bloomingdale

CITY OF PASSAIC
RESOLUTION NO. 20-11-352

RESOLUTION AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS, a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Passaic that the City of Passaic is hereby authorized as to the following:

1) To adopt in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction; and

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified; and

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority; and

4) Will continue its support of the Mitigation Planning Committee as described within the Plan; and

5) Will help to promote and support the mitigation successes of all participants in this Plan; and

6) Will incorporate mitigation planning as an integral component of government and partner operations; and

7) Will provide an update of the Plan in conjunction with the County no less than every five years; and

BE IT FURTHER RESOLVED that the Mayor and City Clerk are hereby authorized and directed to execute any documents and/or undertake any and all such actions necessary to effectuate the purpose of this Resolution.

INTRODUCED BY COUNCILPERSON: Jose Garcia

SECONDED BY COUNCILPERSON: Thania Melo

Record of Council Vote on Final Passage	Aye	Nay	Abstain	Absent
GARCIA, J.	x			
MELO, T.	x			
LOVE, T.				x
MUNK, C.	x			
PATEL, S.				x
SCHAER, G.	x			
SCHWARTZ, D.	x			

ADOPTED ON: November 24, 2020

Gary S. Schaer, Council President

Amada Curling, City Clerk

R408-20

RESOLUTION OF THE CITY OF CLIFTON
AUTHORIZING THE ADOPTION OF THE
2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Council of the City of Clifton, County of Passaic and State of New Jersey hereby adopt, in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction, will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified; will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority; will continue its support of the Mitigation Planning Committee as described within the Plan; will help to promote and support the mitigation successes of all participants in this Plan; will incorporate mitigation planning as an integral component of government and partner operations; will provide an update of the Plan in conjunction with the County no less than every five years.

Passed: November 2, 2020

James Anzaldi, Mayor

Nancy Ferrigno, City Clerk

BOROUGH OF HALEDON
PASSAIC COUNTY, NEW JERSEY
RESOLUTION

Motion by: Almaita **Seconded by: Tasic**

RESOLUTION #2020-166

TITLE: ACCEPTANCE AND ADOPTION OF FLOOD MITIGATION PLAN PER RECOMMENDATION OF THE HALEDON OFFICE OF EMERGENCY MANAGEMENT

WHEREAS, the Haledon Office of Emergency Management has submitted to the Haledon Governing Body the Flood Mitigation Plan to be accepted and adopted; and

WHEREAS, this Plan will be incorporated into the Passaic County Mitigation Plan;

NOW THEREFORE BE IT RESOLVED, by the Governing Body of the Borough of Haledon that the Flood Mitigation Plan prepared by the Haledon Office of Emergency Management be accepted and approved to become part of the Passaic County Mitigation Plan.

Name	Motion	Second	Roll Call Vote		Abstain	Absent
			Yes	No		
Domenick Stampone						
Nereyda Curiel			x			
Aleksandra Tasic		x	x			
Mounir Almaita	x		x			
Carlos Aymat			x			
Junior Morris			x			
Michael Johnson						x

This resolution was duly adopted by the Council of the Borough of Haledon at a meeting held on November 12, 2020.

Allan R. Susen, RMC/MMC
Municipal Clerk/Administrator

RESO. NO. 125-20

BOROUGH OF HAWTHORNE
County of Passaic
State of New Jersey

CERTIFICATION
I, Lori Fernandez, Borough Clerk of the Borough of Hawthorne, County of Passaic, State of New Jersey, do hereby certify this copy of R125-20 to be a true copy as adopted by the Municipal Council on NOV. 4, 2020

W. Fernandez
Lori Fernandez, RMC, CMC, Borough Clerk

RESOLUTION NO. 125-20

Resolution, Introduced by Council Person B Bennett *Date: November 4, 2020*

AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Municipal Council of the Borough of Hawthorne adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

1) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
2) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
3) Will continue its support of the Mitigation Planning Committee as described within the Plan.
4) Will help to promote and support the mitigation successes of all participants in this Plan.
5) Will incorporate mitigation planning as an integral component of government and partner operations.
6) Will provide an update of the Plan in conjunction with the County no less than every five years.

Name	Motion	Second	Yes	No	Abstain	Absent
Bennett	X		X			
Laiosa			X			
Lane			X			
Sciarra		X	X			
Matthews			X			
Mele			X			
Wojtecki			X			

Frank E. Matthews, Council President

W. Fernandez
Lori Fernandez, RMC, CMC, Borough Clerk

Factual Content Certified by — Name / Title / Date

Approved as to form and legality on basis of facts set forth 11/4/20
Borough Attorney — Date

RESOLUTION [C] 20-11-09 - #3

A RESOLUTION OF THE GOVERNING BODY OF THE TOWNSHIP OF LITTLE FALLS AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Township of Little Falls:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
4) Will continue its support of the Mitigation Planning Committee as described within the Plan.
5) Will help to promote and support the mitigation successes of all participants in this Plan.
6) Will incorporate mitigation planning as an integral component of government and partner operations.
7) Will provide an update of the Plan in conjunction with the County no less than every five years.

APPROVED: NOVEMBER 9, 2020

Mayor James Belford Damiano
Township of Little Falls

ATTEST:
Cynthia Kraus, Municipal Clerk
Township of Little Falls

Certified To Be A
True Copy Of The Original

Township Clerk
Little Falls, N.J. 07424

BOROUGH OF NORTH HALEDON

RESOLUTION

TITLE: AUTHORIZATION / ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY, HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of North Haledon:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

Randy George

Randy George, Mayor

Duly adopted
this 16th day of December 2020

Renate Elatab

Renate Elatab, Municipal Clerk

Resolution of the City of Paterson, N.J.

No. 17 Res. # 20-731 Date of Adoption December 29, 2020

Division

Factual Contents Certified By
Kathleen McTaggart 12/21/20
Title Date

Approved As to Form and Legality on Basis of Facts Set Forth
Corporation Counsel 12/29/20
Date

TITLE: **RESOLUTION OF THE GOVERNING BODY OF THE CITY OF PATERSON, AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE**

COUNCILPERSON LUIS VELEZ Introducing the Following Resolution:

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Municipal Council hereby authorizes the City of Paterson:

1) To adopt, in its entirety, of the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan, and execute the actions identified in the Plan that pertain to this jurisdiction.

2) To use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) To coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) To continue support of the Mitigation Planning Committee as described within the Plan.

5) To help to promote and support the mitigation successes of all participants in this Plan.

6) To incorporate mitigation planning as an integral component of government and partner operations.

7) To provide an update of the Plan in conjunction with the County no less than every five years.

RESOLUTION OF THE GOVERNING BODY OF THE CITY OF PATERSON, AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

STATEMENT OF PURPOSE

This Resolution authorizes the City of Paterson to adopt the 2020 Passaic County Hazardous Mitigation Plan Update, and to take the steps set forth above to execute the said plan and its update.

Z:\documents\Ben-David Seligman\Legal Matters Without Files\Fire\Hazard Mitigation Plan\res.hazard.mitigation.plan.BDS(County Template)12.29.20.docx

SECONDED BY COUNCILPERSON ALAA "AL" ABDELAZIZ

Do Not Use Space Below This Line

RECORD OF COUNCIL VOTE ON FINAL PASSAGE	*AYE*	*NAY*	*ABSTAIN*	*ABSENT*
1. ABDELAZIZ, ALAA "AL"	X			
2. COTTON, RUBY N.				X
3. DAVILA, MARITZA				X
4. JACKSON, MICHAEL	X			
5. KHALIQUE, SHAHIN	X			
6. MENDEZ, ALEX	X			
7. MIMMS, LILISA				X
8. RIVERA, FLAVIO	X			
9. VELEZ, LUIS	X			

Adopted at a meeting of the Municipal Council of the City of Paterson, N.J., December 29, 2020

FLAVIO RIVERA President of the Council

SONIA L. GORDON City Clerk

This Resolution when adopted must remain in the custody of the City Clerk. Certified copies are available.

Form 5

RESOLUTION NO. 20-212

A RESOLUTION OF THE MAYOR AND COUNCIL OF THE BOROUGH OF POMPTON LAKES AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of Pompton Lakes:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
4) Will continue its support of the Mitigation Planning Committee as described within the Plan.
5) Will help to promote and support the mitigation successes of all participants in this Plan.
6) Will incorporate mitigation planning as an integral component of government and partner operations.
7) Will provide an update of the Plan in conjunction with the County no less than every five years.

Approved:

MICHAEL SERRA, MAYOR

Certification:

I hereby certify that the above resolution is a true copy of the resolution adopted by the Mayor and Council at their regular meeting held on Wednesday, November 11, 2020 at 7:30 p.m. in the Pompton Lakes Municipal Building, 25 Lenox Avenue, Pompton Lakes, New Jersey.

Elizabeth Brandsness, RMC
Municipal Clerk

cc: oem

COUNCIL OF THE BOROUGH OF PROSPECT PARK
PASSAIC COUNTY, NEW JERSEY

RESOLUTION NO.2020-161

TITLE: A RESOLUTION OF THE MAYOR AND COUNCIL OF THE BOROUGH OF PROSPECT PARK AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Council of the Borough of Prospect Park:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

I hereby certify that this resolution, consisting of 2 page(s), was adopted at a Regular Meeting of the Borough Council of the Borough of Prospect Park, held this 16th day of November, 2020.

	Moved	Second	Ayes	Nays	Abstain	Absent
Matari			✓	✓		
Artis				✓		
Hussain				✓		
Ortiz				✓		
Perez				✓		
Shah		✓		✓		

Mohamed T. Khairullah
Mayor

Erin Delaney, RMC, MPA
Municipal Clerk

Resolution Number
2020-244

A RESOLUTION OF THE MUNICIPAL COUNCIL OF THE BOROUGH OF RINGWOOD AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of Ringwood:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

LINDA M. SCHAEFER, MAYOR

I hereby certify that the above Resolution was adopted by the Municipal Council of the Borough of Ringwood at its Business Meeting of December 15, 2020.

NICOLE LANGENMAYR, RMC
MUNICIPAL CLERK

Council Member	Motion	Second	Ayes	Nays	Abstain	Absent
Schaefer			X			
Speer			X			
Bolton			X			
Ferretti			X			
Matteo-Landis		X	X			
McCracken	X		X			
O'Keefe			X			

Passaic County Hazard Mitigation Plan In-Kind Tracking

Jurisdiction: BOROUGH OF RINGWOOD

Name:		**Title**	

Date	**Start Time**	**End Time**	**# hours**	**Task Description**	**Hourly Rate**	**Total** *(# hours x rate)*	**Comments** *(describe task in more detail)*
					$	$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	
						$	

Passaic County HMP Grant In-Kind Tracker

Jurisdiction:

Name: | **Title:**

Date	Start Time	End Time	Duration (Total Hours)	Task Description	Hourly Rate	Total	Comments (describe task in more detail)			
						$ -				
						$ -				
						$ -				
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TOTAL			0	0	$ -	$ -				

BOROUGH OF TOTOWA
COUNTY OF PASSAIC
STATE OF NEW JERSEY

RESOLUTION NO. 121-2020

RESOLUTION OF THE MAYOR AND COUNCIL OF THE BOROUGH OF TOTOWA AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment and the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS, a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

NOW, THEREFORE, BE IT RESOLVED, that the Mayor and Council of the Borough of Totowa do hereby authorize and adopt the following actions:

1. Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2. Will use the adopted and approved portions of the Plan to guide pre- and post- disaster mitigation of the hazards identified.

3. Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4. Will continue its support of the Mitigation Planning Committee as described within the Plan.

5. Will help to promote and support the mitigation successes of all participants in this Plan.

6. Will incorporate mitigation planning as an integral component of government and partner operations.

7. Will provide an update of the Plan in conjunction with the County no less than every five years.

ATTEST:

JOSEPH WASSEL, RMC
MUNICIPAL CLERK

BOROUGH OF TOTOWA

By: _____
JOHN COIRO
MAYOR

I, Joseph Wassel, Municipal Clerk of the Borough of Totowa do hereby certify that the above is a true copy of a Resolution passed by the Municipal Council of the Borough of Totowa at a regular meeting held on November 10, 2020.

JOSEPH WASSEL, RMC
MUNICIPAL CLERK

Dated: November 10, 2020

BOROUGH OF WANAQUE
COUNTY OF PASSAIC
STATE OF NEW JERSEY

RESOLUTION #181-0-2020

RESOLUTION AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS, a coalition of Passaic County Municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of Wanaque, in the County of Passaic and State of New Jersey:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre-and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in the Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in conjunction with the County no less than every five years.

Dated: November 9, 2020

RECORD OF COUNCIL VOTE

Councilman	*Motion*	*Second*	*Yes*	*No*	*Abstain*	*Councilman*	*Motion*	*Second*	*Yes*	*No*	*Abstain*
Balunis			√			Pasquariello	√		√		
Cortellessa			√			Pettet		√	√		
Leonard			Absent			Willse			√		

ATTEST:

Katherine J. Falone RMC, CMC
Municipal Clerk

Daniel Mahler
Mayor

This resolution, when adopted, must remain in the possession of the Municipal Clerk. Certified copies are available.

TOWNSHIP OF WAYNE
COUNTY OF PASSAIC
STATE OF NEW JERSEY
2020
RESOLUTION NO. 331

A motion was made by Jonathan Ettman seconded by Richard Jasterzbski that the following resolution be adopted:

AUTHORIZING THE ADOPTION OF THE
2020 PASSAIC COUNTY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within the County of Passaic have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post- disaster hazard mitigation programs; and

WHEREAS, a coalition of Passaic County municipalities with similar planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a sets of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

NOW, THEREFORE, BE IT RESOLVED by the Township Council of the Township of Wayne that the Township hereby:

1. Adopts in its entirety the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the Township's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to the Township;
2. Will use the adopted and approved portions of the Plan to guide pre and post disaster mitigation of the hazards identified;
3. Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under the Township's authority;
4. Will continue its support of the Mitigation Planning Committee as described within the Plan;
5. Will help to promote and support the mitigation successes of all participants in the Plan;
6. Will incorporate mitigation planning as an integral component of government and partner operations;
7. Will provide an update of the Plan in conjunction with the County no less than every five (5) years.

ROLL CALL:

AYES: Jonathan Ettman, Richard Jasterzbski, Franco Mazzei, Francine Ritter, Al Sadowski, Jill Sasso, Joseph Schweighardt, David Varano, Joseph Scuralli

NAYS: None

ABSENT: None

THIS IS TO CERTIFY THAT THE FOREGOING IS A TRUE AND EXACT COPY OF A RESOLUTION ADOPTED BY THE TOWNSHIP COUNCIL OF THE TOWNSHIP OF WAYNE AT THE REGULAR MEETING HELD ON DECEMBER 2, 2020.

_____
PAUL V. MARGIOTTA
TOWNSHIP CLERK

Township of West Milford

Passaic County, New Jersey

~ Resolution 2020 – 338 ~

RESOLUTION OF THE TOWNSHIP OF WEST MILFORD, COUNTY OF PASSAIC AND STATE OF NEW JERSEY AUTHORIZING THE ADOPTION OF 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS, a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Township Council of the Township of West Milford, County of Passaic, State of New Jersey hereby authorize the following:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
4) Will continue its support of the Mitigation Planning Committee as described within the Plan.
5) Will help to promote and support the mitigation successes of all participants in this Plan.
6) Will incorporate mitigation planning as an integral component of government and partner operations.
7) Will provide an update of the Plan in conjunction with the County no less than every five years.

Adopted: November 4, 2020

Adopted this 4th day of November, 2020
and certified as a true copy of an original.

William Senande

William Senande, Township Clerk

BOROUGH OF WOODLAND PARK
PASSAIC COUNTY, NEW JERSEY
RESOLUTION R20-307

A RESOLUTION OF THE BOROUGH OF THE WOODLAND PARK AUTHORIZING THE ADOPTION OF THE 2020 PASSAIC COUNTY, NEW JERSEY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all jurisdictions within Passaic County have exposure to hazards that increase the risk to life, property, environment, and the County and local economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; a coalition of Passaic County municipalities with like planning objectives has been formed to pool resources and create consistent mitigation strategies within Passaic County; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Borough of Woodland Park:

1) Adopts in its entirety, the 2020 Passaic County Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Hazard Mitigation Plan and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.

2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.

3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.

4) Will continue its support of the Mitigation Planning Committee as described within the Plan.

5) Will help to promote and support the mitigation successes of all participants in this Plan.

6) Will incorporate mitigation planning as an integral component of government and partner operations.

7) Will provide an update of the Plan in

Record of Mayor and Council Vote on Passage

	AYE	NAY	Abstain	Absent		AYE	NAY	Abstain	Absent
Kallert	✓				Pascrell	✓			
DeCesare	✓				Spinelli	✓			
Gatti	✓				Mayor Kazmark	✓			
Holloway	✓								

This resolution was approved by the Mayor and Council of the Borough of Woodland Park at a regular scheduled meeting held on the 18th day of November, 2020. Signed and sealed before me.

Sandra Olivola
Sandra Olivola, Municipal Clerk

November 18, 2020
Dated

APPENDIX B. PARCIPATION DOCUMENTATION

This appendix provides documentation to illustrate the significant efforts undertaken to support a broad and inclusive engagement of the participants during this hazard mitigation planning process.

B.1 MEETING AND WORKSHOP PARTICIPATION

Table B-1 provides a broad overview of state, county, municipal and stakeholder personnel that attended meetings and workshops throughout the Passaic County HMP update planning process. All jurisdictions were encouraged to attend the kick-off meeting, risk assessment meeting, mitigation workshop and meet individually with the contract consultant. As discussed in Section 2 (Planning Process), primary and secondary points of contact were identified for each jurisdiction, but moreover, these points of contact were asked to work with their 'mitigation team' to ensure input was provided across all jurisdiction departments. Further, the NFIP Floodplain Administrator was identified and participated by providing information on each community's NFIP compliance and mitigation programs. Table 9.X-19 in each jurisdictional annex (Section 9) summarizes the additional individuals that participated in each jurisdiction, as well as their method of participation. During the planning process the consultant contacted each participant to offer support, explain the process, and facilitate the submittal and review of critical documents.

The participating jurisdictions agreed to abide by the Planning Partner Expectations and Planning Committee Guidelines which established the Steering Committee. Letters of Intent to Participate indicating municipal planning efforts are included in this appendix. The Steering Committee served as the core of the working group. Participation is defined as having input to the hazard analysis (providing critical facility, hazard event, vulnerability data, hazard ranking), contributed to the Strengths, Weaknesses, Obstacles and Opportunities exercise, and as having participated in the mitigation workshop or alternate annex meetings as described in the HMP for the purpose of creating a mitigation strategy to be included in each municipality's annex in Section 9 (Jurisdictional Annexes).

Table B-1. Meeting Participation

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Passaic County												
Robert A. Lyons	Director, County OEM Coordinator	X	X			X	X	X	X	X	X	X
Maryann Trommelen	Deputy Coordinator	X		X		X	X	X	X	X	X	X
Maria Dombayci	Deputy Coordinator	X				X	X	X	X	X	X	X
Fred Batelli	Deputy Coordinator	X				X					X	X
Edward Murphy	County OEM					X		X				
Elizabeth Ward	Principal Planner	X				X	X	X	X			
Jonathan Pera	County Engineer, Department of Engineering	X				X	X	X	X	X		X
Mike Lysicatos	Director, Department of Planning and Economic Development	X				X						X
Kenneth A. Simpson	Supervisor, Road Department	X				X						X
Darryl Sparta	Director, Parks and Recreation	X				X						X
Kathleen M Caren	Open Space Coordinator					X				X		

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Bruce James	County Freeholder					X				X		
Bloomingdale (B)												
Mike Hudson	OEM Coordinator			X		X				X	X	X
Jonathan Dunleavy	Mayor		X			X					X	X
Thomas Boorady	Borough Engineer				X	X						X
Albert Gallagher	Superintendent Public Works					X					X	X
Donna Mollineaux	CFO											X
Chris Walthour	Building Code Official											X
Joseph Borell	Police Chief											X
Eric Tuason	Fire Chief											X
Clifton (C)												
Angelina Tirado	OEM Coordinator		X			X		X				X
Ron Laube	Deputy OEM Coordinator					X		X				X
Mike Onder	Deputy OEM Coordinator			X		X		X				X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Ernie Tedesco	Construction Official				X	X						X
James Anzaldi	Mayor											X
Allan Ryff	Land Use Planner											X
Joe Kunz	Fiscal/CFO											X
Jason Vanwinkle	Public Works Director											X
Thomas Rinaldo	Chief of Police											X
Frank Rezioso	Fire Official											X
Haledon (B)												
Mounir Almaita	OEM Coordinator		X									X
Lt. George Guzman	Deputy OEM Coordinator			X		X					X	X
Phil Cheff	Construction Official				X							X
Domenick Stampone	Mayor											X
David Atkinson	Land Use Planner and Engineer											X
Steve Sanzari	Fiscal/CFO											X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Anthony Harrington	Public Works Foreman											X
Angelo J. Daniele	Police Chief											X
Tom Bakker	Fire Chief											X
Hawthorne (B)												
Brian Vanderhook	Deputy OEM Coordinator			X		X		X				X
Richard M McAuliffe	OEM Coordinator		X			X				X	X	X
Richard Stewen	Building Official				X							X
Richard S. Goldberg	Mayor											X
Eric Maurer	Borough Administrator											X
Laura Foley	CFO											X
Robert Scully	Public Works Director											X
Steven Boswell	Engineer											X
James Knepper	Police Captain											X
Gene DeAugustine	Fire Official											X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Little Falls (Twp)												
James DiMaria	Construction/Zoning Official; NFIP Floodplain Administrator; Fire Official		X		X	X		X			X	X
Daniel D Gianduso	OEM Coordinator			X		X		X		X		X
Thomas Lemanowicz	Engineer											X
James Damiano	Mayor											X
Jeff Janota	Land Use Planner											X
Charles Cuccia	Fiscal/CFO											X
Phil Simone	Public Works Director											X
Steve Post	Chief of Police											X
North Haledon (B)												
Lt. Anthony Conforti	Lt./Asst. OEM Coordinator			X		X		X		X	X	X
A. Chief Todd Darby	A. Chief/OEM Coordinator		X			X				X	X	X
Phil Cheff	Construction Official				X							X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Randy George	Mayor											X
Renate Elatab	Borough Administrator											X
Joe Pomante	Engineer											X
Chris Bataglia	Fiscal/CFO											X
Michael Kauker	Land Use Planner											X
Bill Graham	Public Works Director											X
Jimmy Booth	Fire Official											X
Passaic (C)												
Fred Corbitt	Assistant Supt. DPW					X		X		X		X
Alberto M Ventura	Construction Official					X						
Walter Porto	Passaic OEM		X			X		X				X
Dennis Harrington	City Engineer				X	X						X
Omar Garcia	Asst Dir. Of Finance					X						X
Amada Curling	City Clerk					X						X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Walter Batelli	Passaic OEM					X				X		
Piyush Patel	OEM Coordinator/Captain Police			X		X		X		X		X
Salvatore Presti	Passaic City Planning Dept					X		X				
Michael Wanklen	Passaic City Fire Coordinator					X		X				
Omar Montanez	Deputy Coordinator									X		
Hector C. Lora	Mayor											X
Ricardo Fernandez	Business Administrator/Land Use Planner											X
Luis Sanchez	Fire Official											X
Paterson (C)												
Fred Margron	City Engineer			X		X		X			X	X
Rhonda E Thompson	OEM Coordinator		X			X		X		X		X
Cameron Gardner	Deputy Coordinator									X		
Chief Gabriel Aboyoun	OEM Coordinator		X									X
Jerry Lobozzo	Construction Official				X							

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Elizabeth Fonrnier	Deputy Coordinator										X	
Andre Sayegh	Mayor/Administrator											X
Michael Deutsch	Land Use Planner											X
Marge Cherone	Fiscal/CFO											X
William Rodriguez	Public Works Director											X
Chief Ibrahim Baycora	Police Official											X
Pompton Lakes (B)												
Albert Evangelista	OEM Coordinator		X			X		X		X	X	X
Kevin Boyle	Borough Administrator			X				X				X
Sal Poli	Construction Official				X							X
Daniel Cotrell	Deputy Coordinator					X				X		X
William D Baig	OEM Asst Coordinator					X				X		X
Daniel O'Rourke	Public Works Director											X
Prospect Park (B)												

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Fernando Nangles	OEM Deputy					X				X		
Ariosto Rodriguez	OEM Coordinator		X			X					X	X
Yeisy Reyes	Deputy OEM Coordinator			X								
Kevin Valt	Department Public Works Supervisor				X							
Intashan Chowdhury, MPA	Administrator											X
Ken Valt	DPW Superintendent											X
Hana Hataf	Finance											X
Bill Mullanaphy	Deputy OEM Coordinator											X
Farah Gilani	Engineer											X
Paul Ricci	Land Use Planner											X
James Booth	Fire Official											X
Captain Ammen Matari	Police Official											X
Ringwood (B)												
Pat Murray, Jr.	OEM Coordinator			X		X		X			X	X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Scott Heck	Borough Manager/Director DPW		X		X	X		X				
Helen Forsa	Land Use Administrator											X
Jeff Yuhas	Engineer											X
Sal Poli	Construction Official and NFIP Floodplain Administrator (FPA)				X							X
Nicole Langemayr	Borough Clerk											X
Debbie Buchanan	CFO											X
Linda Schaefer	Mayor											X
Don Devlin	Fire Official											X
Joseph Walker	Chief of Police											X
Totowa (B)												
Rich Schopperth	Fire Marshall		X			X				X		X
Joseph Wassel	Municipal Clerk			X		X						X
Allan Burghardt	Construction Official				X	X						X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
James Niland	Public Works					X						X
Lisa Nash	CMFO/Finance											X
Tom Lemanowicz	Brough Engineer											X
John Coiro	Mayor											X
Darlene Green	Land Use Planner											X
Carmen Veneziano	Police Chief											X
Wanaque (B)												
Michael Cristaldi	Alaimo Engineering				X	X		X		X		X
Michael Bruscc	DPW					X		X			X	X
Angelo Calabro	OEM Coordinator		X			X		X		X		X
Edward Schroeder	Deputy OEM Coordinator			X		X					X	X
Marann Brindisi	CFO/Finance											X
Daniel Mahler	Mayor											X
Paul Carelli	Borough Administrator											X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Mark Oliveri	Fire Official											X
Wayne (Twp)												
Chris Kok	Township Planner					X						X
Dan Daly	OEM Coordinator		X			X		X		X	X	X
Heather Vitz-Del Rio	Township Engineer					X		X				
Sharon Brown	OEM Secretary				X	X		X		X	X	X
Neal Bellet	Business Administrator			X								
Heather McNamara	CFO / Finance											X
Robert Minarick	Fire Official											X
West Milford (Twp)												
Michael Moscatello	Deputy Coordinator OEM		X			X		X		X	X	X
Ed Steines	OEM Coordinator and Department of Public Works Director			X								X
James Lupo	Zoning Officer				X							X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
Ellen Mageean	CFO/Finance											X
Michele Dale	Mayor											X
Bill Senande	Township Administrator											X
James DeVore	Chief of Police											X
Woodland Park (B)												
George Galbraith	Superintendent of Public Works, Stormwater Coordinator, Director of Emergency Preparedness	X	X			X	X	X	X	X	X	X
Kevin Galland	Administrator and Municipal Clerk			X								
Allan Burghardt	Construction Code Official / Building Subcode Official / Building Inspector / Code Enforcement Officer				X							
Heather Barkenbush	CFO/Finance											X
Keith Kazmark	Mayor											X
Michael Muccio	Fire Official											X

Name	Title / Position	Steering Committee Member	Primary Point of Contact	Secondary Point of Contact	NFIP Floodplain Administrator	Attended Meeting(s)	Attended Steering Committee Meeting #1 - August 15, 2019	Attended Kickoff Meeting - October 10, 2019	Attended Steering Committee Meeting #2 - December 10, 2019	Attended Planning Partnership Risk Assessment Meeting - January 23, 2020	Attended Planning Partnership Mitigation Strategy Workshop - February 20, 2020	Attended Annex Support Meetings / Reviewed Annex
John Uzzalino	Police Official											X
Stakeholders												
Lance Visone	NJOEM					X		X				
Alejandro Polanco	NJOEM					X				X		
Chris Gesualdo	NJOEM					X				X		
Howard Wolf	NJOEM					X					X	
Katelynne Wolf	NJOEM					X					X	
Jennifer Fogliano	NJTPA					X						

B.2 LETTERS OF INTENT TO PARTICIPATE

Municipalities were provided a copy of the Planning Partner Expectations and asked to formally notify the County of their intent to participate via a Letter of Intent to Participate and to identify a primary and secondary planning point of contact to serve on a Planning Committee and represent the interests of their respective community. In addition, each municipal NFIP Floodplain Administrator (FPA) was identified and requested to actively participate in the planning process. The signed Letters of Intent to Participate are included in this section.

BOROUGH OF BLOOMINGDALE

101 HAMBURG TURNPIKE • BLOOMINGDALE, NEW JERSEY 07403
(TEL) 973-838-0778 (FAX) 973-838-5115

August 19, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Bloomingdale

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of the Borough of Bloomingdale, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of the Borough of Bloomingdale:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development
  - Identification of natural hazard risk areas
  - Identification of natural hazard events and losses that have impacted your community in the last five years
  - Identification of plans, studies, reports and ordinances addressing natural hazard risk

    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Jonathan Dunleavy **Position/Department: Mayor**

Phone Number: 973-838-0778 ext. 243 **Email Address: jdunleavy@bloomingdalenj.net**

Alternate/Secondary POC: Mike Hudson **Position/Department: OEM Coordinator**

Phone Number: 973-838-0778 **Email Address: OEM@bloomingdalenj.net**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Thomas Boorady **Position/Department: Borough Engineer**

Phone Number: 983-835-8300 **Email Address: tab@darmofalski.com**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Jonathan Dunleavy, Mayor

City of Clifton

Clifton Fire Department
Office of Emergency Management
900 Clifton Avenue
Clifton, New Jersey 07013

Lieutenant Angelina Tirado
Municipal O.E.M. Coordinator
Atirado@cliftonnj.org

(973) 470-5801
FAX (973) 470-5844

August 8, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Clifton

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Clifton, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Clifton:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions
- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community
- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.

- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC:	**Position/Department:**
Angelina Tirado	**OEM Coordinator/Fire**
Phone Number:	**Email Address:**
201-249-3269	**Atirado@cliftonnj.org**
Alternate POC:	**Position/Department:**
Michael Onder	**Deputy OEM Coordinator**
Phone Number:	**Email Address:**
973-216-5711	**Monder@cliftonnj.org**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA	**Position/Department:**
Dominick Villano	**City Manager**
Phone Number:	**Email Address:**
973-470-5854	**dvillano@cliftonnj.org**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Lt. Angelina Tirado,
Municipal OEM Coordinator

Borough of Haledon

510 Belmont Avenue
Haledon, New Jersey 07508
(973) 595-7766 (Main)
(973) 790-4781 (Fax)

Office of Emergency Management

Mayor Domenick Stampone, Esq.

Emergency Management Coordinator Mounir Almaita

Deputy Emergency Management Coordinator Lieutenant George Guzman

To: Director Robert A. Lyons, Passaic County Emergency Management Coordinator

From: Lieutenant George Guzman, Haledon Deputy Emergency Management Coordinator

Cc: Mr. Mounir Almaita, Haledon Emergency Management Coordinator;
Ms. Maryann Trommelen, Passaic County Deputy Emergency Management Coordinator

Date: August 1, 2019

RE: Passaic County All Hazard Mitigation Plan Update/Authorization and Letter of Intent

Per your letter dated July 19, 2019, the municipality of Haledon, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Haledon:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Mounir Almaita **Position/Department:** OEM Coordinator

Phone Number: 862.262.4294 **Email Address:** malmaita@haledonpd.org

Alternate/Secondary POC: LT. George Guzman **Position/Department:** Dep. OEM Coordinator

Phone Number: 862.262.2832 **Email Address:** gguzman@haledonpd.org

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Phil Cheff **Position/Department:** Construction Official

Phone Number: 973-595-7766 **Email Address:** pcheff@haledonboronj.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Respectfully,

George Guzman, Jr.

Lieutenant George Guzman, Deputy Emergency Management Coordinator
Haledon Borough Police Department
Office of the Police Administration
510 Belmont Avenue
Haledon, New Jersey 07508
973.790.4444 (Main)
973.790.0966 (Fax)
862.262.2832 (Cell)
gguzman@haledonpd.org

RICHARD S. GOLDBERG
Mayor

Department of Public Safety
Bureau of Police

Borough of Hawthorne, County of Passaic
445 Lafayette Avenue, Hawthorne, New Jersey 07506

RICHARD M. McAULIFFE
CHIEF OF POLICE

OFFICE OF THE CHIEF
973-427-1800

August 27, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality Hawthorne

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Hawthorne, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Hawthorne:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development

RICHARD S. GOLDBERG
Mayor

RICHARD M. McAULIFFE
CHIEF OF POLICE

Department of Public Safety
Bureau of Police

Borough of Hawthorne, County of Passaic
445 Lafayette Avenue, Hawthorne, New Jersey 07506

OFFICE OF THE CHIEF
973-427-1800

- Identification of natural hazard risk areas
- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

RICHARD S. GOLDBERG
Mayor

Department of Public Safety
Bureau of Police

Borough of Hawthorne, County of Passaic
445 Lafayette Avenue, Hawthorne, New Jersey 07506

RICHARD M. McAULIFFE
CHIEF OF POLICE

OFFICE OF THE CHIEF
973-427-1800

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Richard M. McAuliffe **Position/Department: OEM Coordinator**

Phone Number: 973-427-1800 **Email Address: rmcauliffe@hawthornepdnj.org**

Alternate/Secondary POC: Brian Vanderhook Position/Department: Deputy OEM Coordinator

Phone Number: 973-427-1800 **Email Address: bvanderhook@hawthornepdnj.org**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA Richard Stewen **Position/Department: Building Official**

Phone Number: 973-304-2058 **Email Address: rstewen@hawthornenj.org**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Richard M. McAuliffe
OEM Coordinator

TOWNSHIP OF LITTLE FALLS
TOWNSHIP ADMINISTRATOR
225 Main Street, Little Falls, New Jersey 07424
973-890-4500

July 24,2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Township of Little Falls

Dear Director Lyons:

Per your letter dated July 19, 2019, the Township of Little Falls is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the Township of Little Falls:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development
  - Identification of natural hazard risk areas
  - Identification of natural hazard events and losses that have impacted your community in the last five years
  - Identification of plans, studies, reports and ordinances addressing natural hazard risk
  - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Dan Gianduso **Position/Department: OEM Coordinator/ PD**

Phone Number: 973-960-9268 **Email Address: Dgianduso@lfnj.com**

Alternate/Secondary POC:
James DiMaria **Position/Department: Construction Code Official/ Administration**

Phone Number:973-766-2478 **Email Address: Jdimaria@lfnj.com**

TOWNSHIP OF LITTLE FALLS
TOWNSHIP ADMINISTRATOR
225 Main Street, Little Falls, New Jersey 07424
973-890-4500

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA :
James DiMaria **Position/Department: Construction Code Official/ Administration**

Phone Number:973-766-2478 **Email Address: Jdimaria@lfnj.com**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Very Truly Yours,

Charles S. Cuccia
Township Administrator

Borough of North Haledon

POLICE DEPARTMENT

103 Overlook Avenue
North Haledon, NJ 07508

Todd Darby
Acting Chief

Telephone 973-423-1111
Fax 973-304-0222

July 9, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of North Haledon

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of North Haledon, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of North Haledon:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data

- Identification of new development and anticipated development
- Identification of natural hazard risk areas
- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: A. Chief Todd Darby Position/Department: A. Chief/OEM Coordinator

Phone Number: 973-800-3649 Email Address: tdarby@northhaledonnj.com

Alternate/Secondary POC: Lt. Anthony Conforti Position/Department: Lt./Asst. OEM Coordinator

Phone Number: 973-715-8888 Email Address: aconforti@northhaledonnj.com

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Phillip Chef | Position/Department: FPA/Construction

Phone Number: 973-423-9422 | Email Address: xpjcx@aol.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

A. Chief Todd Darby
OEM Coordinator

CITY OF PASSAIC

330 PASSAIC STREET
PASSAIC, NEW JERSEY 07055

OFFICE OF THE MAYOR
HECTOR C. LORA

TELEPHONE (973) 365-5510
FAX NUMBER (973) 472-2639
hlora@cityofpassaicnj.gov

July 31, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Passaic

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Passaic is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Passaic:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that their community meets these participation expectations.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development

- Identification of natural hazard risk areas
- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions
- Support public outreach efforts in your community which may include:
- Providing notices of the planning project on our municipal website if available with links to a County project website
- Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
- Advertising and supporting public meetings in your area.
- Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Piyush Patel **Position/Department: Coordinator/OEM**

Phone Number: 973-365-3985 **Email Address: ppatel@cityofpassaicnj.gov**

Alternate/Secondary POC: Walter Porto **Position/Department: Deputy Coordinator/OEM**

Phone Number: 973-703-9814 **Email Address: oem-deputy@cityofpassaicnj.gov**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA Dennis Harrington **Position/Department: Engineer/Engineer Dept.**

Phone Number: 973-365-5624 **Email Address: dharrington@cityofpassaicnj.gov**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Mayor

City of Paterson
Office of the Mayor

André Sayegh
Mayor

City Hall
155 Market Street
Paterson, New Jersey 07505
Phone: (973) 321-1600
Fax: (973) 321-1555

August 9, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Paterson

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Paterson is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Paterson:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Rhonda Thompson **Position/Department:** OEM Coordinator

Phone Number: 973-572-2490 **Email Address:** rthompson@patersonnj.gov

Alternate/Secondary POC: Fred Margron **Position/Department:** Engineer

Phone Number: 973-202-0032 **Email Address:** fmargron@patersonnj.gov

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Jerry Lobozzo **Position/Department:** Construction Official

Phone Number: 973-321-1232 **Email Address:** jlobozzo@patersonnj.gov

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

André Sayegh, Mayor
City of Paterson

BOROUGH OF POMPTON LAKES
25 Lenox Avenue, Pompton Lakes, New Jersey 07442
(973) 835-0143
Fax (973) 839-8132

August 7, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, NJ 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Pompton Lakes

Dear Director Lyons:

Per you letter dated July 19, 2019, the municipality of Pompton Lakes, is committed to participating in the Passaic County and All municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Pompton Lakes.

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

   - Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.

   - Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that thee participation expectations are met by their community.

   - Support the Steering Committee selected to oversee the development of this plan.

   - Provide representation at municipal Planning Committee meetings (4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory date
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.

- Review draft Plan sections when requested and provide comment and input as appropriate.

- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.

- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.

- Involve your local NFIP Floodplain Administrator in the planning process.

- Adopt the Plan by resolution of their governing body after FEMA conditional approval.

- Provide the Steering Committee with salary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Kevin F. Boyle **Position/Department:** Borough Administrator

Phone Number: 973-835-0143 (239) **Email:** administrator@pomptonlakes-nj.gov

Alternate/Secondary POC: Albert Evangelista **Position/Department**: OEM Coordinator

Phone Number: 973-583-2878 **Email:** oem@pomptonlakes-nj.gov

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Sal Poli **Position/Department:** Construction Official

Phone Number: 973-835-0143 (224) **Email:** construction@pomptonlakes-nj.gov

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Kevin F. Boyle
Borough Administrator

Council Meets First and Third Monday of each Month at Municipal Building, North Tenth Street and Brown Avenue

THE BOROUGH OF PROSPECT PARK

106 BROWN AVENUE, PROSPECT PARK, NJ 07508

Mohamed T. Khairullah, Mayor
(973) 790-7902 ext. 519
E-mail: mather@prodigy.net

Intashan Chowdhury, MPA Candidate
Borough Administrator
(973) 790-7902 ext. 532
Fax: (973) 790-0394

September 10, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Prospect Park

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Prospect Park, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Prospect Park.

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development
  - Identification of natural hazard risk areas
  - Identification of natural hazard events and losses that have impacted your community in the last five years
  - Identification of plans, studies, reports and ordinances addressing natural hazard risk

- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Shana Bencosme **Position/Department: OEM Coordinator**

Phone Number: 973-288-5729 **Email Address: snbencosme0820@gmail.com**

Alternate/Secondary POC: Yeisy Reyes **Position/Department: OEM Deputy Coordinator**

Phone Number:973-641-8435 **Email Address: yreyesjr@live.com**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA Kenneth Valt **Position/Department: DPW Supervisor**

Phone Number: 973-296-0101 **Email Address:** valtk@prospectpark.net

Alternate/Secondary FPA: Farah Gilani **Principal Engineer - Fastech Consulting LLC Phone Number: 201-601-0284** **Email Address:** fg@fastechnj.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Intashan Chowdhury
Borough Administrator

pc: Shana Bencosme, OEM Coordinator

BOROUGH OF RINGWOOD

www.ringwoodnj.net
Phone: (973) 962-7037 Fax: (973) 962-1594

Scott Heck, C.P.W.M.
Borough Manager/Director of Public Works
(973) 475-7101

Nicole Langenmayr
Acting Borough Clerk
(973) 475-7102

August 9, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Ringwood

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Ringwood, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Ringwood:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Patrick Murray, Jr. **Position/Department: Office of Emergency Mgmt.**

Phone Number: 917-731-6958 **Email Address: pmmurray@pjmandsons.com**

Alternate/Secondary POC: Scott Heck **Position/Department: Borough Mgr/Director DPW**

Phone Number: 973-475-7101 **Email Address: sheck@ringwoodnj.net**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: Scott Heck **Position/Department: Borough Mgr/Director DPW**

Phone Number: 973-475-7101 **Email Address: sheck@ringwoodnj.net**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Regards,

Scott Heck, C.P.W.M.
Borough Manager/DPW Director

Kevin Walsh
OEM Coordinator

Borough of Totowa

Office of Emergency Management
537 Totowa Road, Totowa, New Jersey 07512

August 15, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Totowa

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Totowa, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Totowa:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:

- Structure and facility inventory data
- Identification of new development and anticipated development
- Identification of natural hazard risk areas
- Identification of natural hazard events and losses that have impacted your community in the last five years
- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Kevin Walsh **Position/Department: OEM Coordinator**

Phone Number: 973-979-3655 **Email Address:Totowanj@optonline.net**

Alternate/Secondary POC: Joseph Wassel **Position/Department: Municipal Clerk**

Phone Number: 973-956-1000 x 1004 **Email Address: jwassel@totowanj.org**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA Allan Burghardt **Position/Department: Construction Official**

Phone Number:973-956-1000 x 1006 **Email Address: aburghardt@totowanj.org**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Kevin Walsh

Borough of Wanaque

PASSAIC COUNTY, NEW JERSEY

MUNICIPAL OFFICE
579 RINGWOOD AVENUE
WANAQUE, NEW JERSEY 07465

Office of:
Capt. Angelo Calabro
O.E.M. Coordinator

Phone: 973-839-3000
Ext. 7137
Fax: 973-839-6120

Date: August 09, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Wanaque

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Wanaque, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Wanaque:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.

- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Det/Capt. Angelo Calabro Position/Department: Wanaque OEM Coor.

Phone Number:862-200-4121 Email Address:acalabro@wanaqueborough.com

Alternate/Secondary POC:Mark Olivieri Position/Department:Deputy OEM Coor.

Phone Number:973-391-7996 Email Address: fdchief@wanaqueborough.com

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

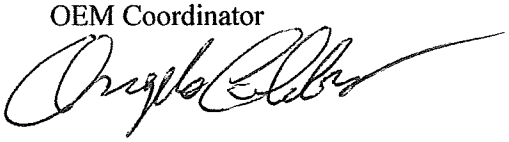
Name of NFIP FPA Michael Cristaldi Position/Department: Alaimo Engineering

Phone Number:973-523-6200 Email Address: mcristaldi@alaimogroup.com

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Angelo Calabro
OEM Coordinator



WAYNE POLICE DEPARTMENT

Captain Daniel Daly
Coordinator
Office of Emergency Management

475 Valley Road
Wayne, New Jersey 07470-3584
Internet: www.WayneTownship.com
Phone: (973) 694-0600
Fax: (973) 872-1003
NCIC: NJ0161400

08/09/19

Director Robert A. Lyons Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of Wayne Township.

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of Wayne Township is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of Wayne Township.

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development
  - Identification of natural hazard risk areas
  - Identification of natural hazard events and losses that have impacted your community in the last five years
  - Identification of plans, studies, reports and ordinances addressing natural hazard risk
  - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Dan Daly **Position/Department: OEM Coordinator**

Phone Number: 201-414-0896 / 973-633-3580 **Email Address: dalyd@waynetownship.com**

Alternate/Secondary POC: Neal Bellet **Position/Department: Business Administrator**

Phone Number: 973-633-3202 **Email Address: belletn@waynetownship.com**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA Heather Vitz-Del Rio **Position/Department: Township Engineer**

Phone Number: 973-694-1800 x3219 **Email Address: vitzdelrih@waynetownship.com**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely, Capt. D. Daly

Capt. Dan Daly, Wayne Township OEM Coordinator

TOWNSHIP OF WEST MILFORD

OFFICE OF EMERGENCY MANAGEMENT

1480 Union Valley Road•West Milford, NJ 07480•Tel: (973) 728-2840•Fax: (973) 728-2880

July 23, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality of West Milford Township

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of West Milford Township, is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of West Milford Township:

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).
- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
  - Structure and facility inventory data
  - Identification of new development and anticipated development
  - Identification of natural hazard risk areas
  - Identification of natural hazard events and losses that have impacted your community in the last five years

- Identification of plans, studies, reports and ordinances addressing natural hazard risk
- Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
  - Providing notices of the planning project on our municipal website if available with links to a County project website
  - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
  - Advertising and supporting public meetings in your area.
  - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.

- Review draft Plan sections when requested and provide comment and input as appropriate.

- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.

- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.

- Involve your local NFIP Floodplain Administrator in the planning process.

- Adopt the Plan by resolution of their governing body after FEMA conditional approval.

- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: Michael Moscatello **Position/Department: Deputy Coordinator OEM**

Phone Number: 973-728-2827 **Email Address: fireoffice2@westmilford.org**

Alternate/Secondary POC: Edward Steines **Position/Department: Coordinator OEM**

Phone Number: 973-728-2713 **Email Address: firecomm@westmilford.org**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA: James Lupo **Position/Department: Zoning Officer**

Phone Number: 973-728-2759 **Email Address: zoning@westmilford.org**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Michael Moscatello
Deputy Emergency Management Coordinator

Borough of Woodland Park

Office of the Mayor

Keith Kazmark
Mayor

Passaic County, NJ
5 Brophy Lane
Woodland Park, NJ 07424
Office: (973) 345-8100 x 210
Fax: (973) 345-8194
Home: (973) 684-3604
Cell: (973) 420-9962
E-Mail: kkazmark@wpnj.us

August 6, 2019

Director Robert A. Lyons
Passaic County Office of Emergency Management
300 Oldham Road
Wayne, New Jersey 07470

Subject: Passaic County All Hazard Mitigation Plan Update
Authorization and Letter of Intent to Participate
Municipality Of Borough of Woodland Park

Dear Director Lyons:

Per your letter dated July 19, 2019, the municipality of the Borough of Woodland Park is committed to participating in the Passaic County and All Municipalities Hazard Mitigation Plan (HMP) Update project. By way of this letter, the municipality of the Borough of Woodland Park.

1. Authorizes the Passaic County HMP Update Steering Committee (aka "Steering Committee"), to guide and direct this planning process, perform certain parts of the planning process, and prepare certain parts of the plan documents on our behalf.

2. Agrees to meet the minimum requirements of jurisdictional participation (a.k.a. the Planning Partner Expectations), specifically:

- Execute and return this "Authorization and Acknowledgement" letter to the Passaic County Office of Emergency Management, attention: Director Robert A. Lyons.
- Identify municipal representatives to serve as the planning point of contacts (POC), below. These people will be responsible for representing their community and assuring that these participation expectations are met by their community.
- Support the Steering Committee selected to oversee the development of this plan.
- Provide representation at municipal Planning Committee meetings (~ 4 meetings over 9 months, including a Kick-Off Meeting, Risk Assessment Meeting, a Jurisdictional Annex Workshop meeting and a Draft HMP meeting).

- Provide data and information about your community as requested by the Passaic County Office of Emergency Management, or the contract consultant, to update your jurisdictional annex including:
    - Structure and facility inventory data
    - Identification of new development and anticipated development
    - Identification of natural hazard risk areas
    - Identification of natural hazard events and losses that have impacted your community in the last five years
    - Identification of plans, studies, reports and ordinances addressing natural hazard risk
    - Identify mitigation activity in your community in the last five years, including progress on previously identified mitigation actions

- Support public outreach efforts in your community which may include:
    - Providing notices of the planning project on our municipal website if available with links to a County project website
    - Providing notice of the planning project, the availability of Plan documents, and notice of public meetings via available local media (e.g. newsletters, flyers, email blasts, social media, etc.)
    - Advertising and supporting public meetings in your area.
    - Supporting outreach to NFIP Repetitive Loss and Severe Repetitive Loss property owners in your community

- Assist with the identification of stakeholders within your community that should be informed and potentially involved with the planning process.
- Review draft Plan sections when requested and provide comment and input as appropriate.
- Prepare and submit a Jurisdictional Annex to the Steering Committee and/or the contract consultant. Templates and instructions to aid in the compilation of this information will be provided to all participating partners. Each partner will be expected to complete their templates in a timely manner and according to the timeline specified by the Steering Committee. The Steering Committee will assure that technical and administrative resources are available to assist with the preparation and completion of the annexes including meeting with the contract consultant to facilitate the review and update.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to your community. These initiatives will be presented in your annex.
- Involve your local NFIP Floodplain Administrator in the planning process.
- Adopt the Plan by resolution of their governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

3. Assigns the following persons to be the Points of Contact for our jurisdiction. We understand that these POCs are responsible for assuring municipal representation at Planning Committee meetings/calls and assuring that the other minimum requirements of jurisdictional participation, as detailed in the Planning Partner Expectations above, are met.

Primary POC: George Galbraith **Position/Department: Director/Woodland Park OEM**

Phone Number: 973-256-1264 **Email Address: ggalbraith@wpnj.us**

Alternate/Secondary POC: Kevin Galland **Position/Department: Administrator / Municipal Clerk**

Phone Number: 973-345-8100 x201 **Email Address: kgalland@wpnj.us**

4. Our designated local Floodplain Administrator (FPA) under the National Flood Insurance Program (NFIP) is:

Name of NFIP FPA **Allan Burghardt** **Position/Department:** Floodplain Admin / Construction Code Official / Bldg. Subcode Official / Bldg. Inspector / Code Enforcement Officer

Phone Number: **973-345-8100 x208** **Email Address: aburghardt@wpnj.us**

5. Recognizes that failure to meet the minimum participation expectations and deadlines, as determined by the Steering Committee will result in our municipality being excluded from the planning process.

Sincerely,

Keith Kazmark
Mayor

B.3 HAZARDS OF CONCERN REVIEW AND RANKING EXERCISES

At the October 2019 kickoff meeting, Steering Committee and municipal representatives were asked to contribute to the hazard identification exercise by reviewing the 2015 hazards of concern and indicating whether there has been a change in hazard event frequency, magnitude or severity over the last few years. In addition, the natural hazards that present the most risk were reported, as well as impacts due to small or nuisance events that need to be addressed.

At the January 2020 risk assessment meeting, Steering Committee and municipal representatives were asked to review their draft risk assessment results based on the calculated hazard ranking using an updated hazard ranking formula. Posters available at the meeting geographically displayed the 2015 hazard ranking results for each municipality compared to the draft 2020 hazard ranking, calculated solely using the updated risk assessment results (high = red, medium = orange, and yellow = low). The review and updates to the draft municipal-specific hazard ranking results were captured on worksheets which were distributed to the points of contact and meeting representatives for each municipality. In addition, the municipal-specific adaptive capacity to hazard events was discussed as related to the individual municipalities and the County as a whole. The municipal-specific adaptive capacity was captured for each hazard of concern on the following worksheets as well. If a municipality was not present at the risk assessment meeting or it the municipality attended the meeting but did not submit a worksheet, their input was collected at individual local annex preparation meetings and reflected in their jurisdictional annex.

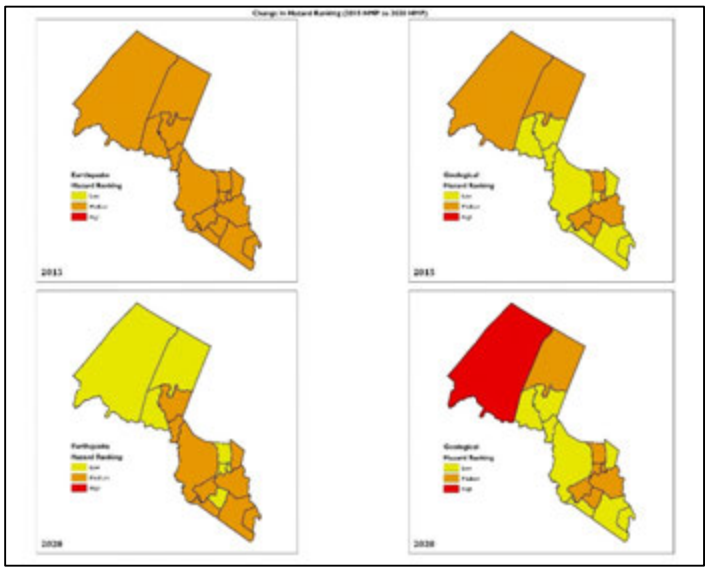


Exhibit B-1. Draft Hazard Ranking Poster

Passaic County
Draft Adaptive Capacity

Name: JONATHAN PETTA Title and Agency COUNTY ENGINEER

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	✓
Dam Failure	Medium	✓
Disease Outbreak	Medium	✓
Drought	Medium	✓
Earthquake	Medium	✓
Extreme Temperature	Medium	✓
Flood	Medium	✓
Geological Hazards	Medium	✓
Hazardous Substances	Medium	✓
Severe Weather	Medium	✓
Severe Winter Weather	High	✓
Wildfire	Medium	✓

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	✓
Dam Failure	Medium	Medium	✓
Disease Outbreak	Medium	Medium	✓
Drought	Medium	Medium	✓
Earthquake	Medium	Low	✓
Extreme Temperature	Medium	Medium	✓
Flood	High	High	✓
Geological Hazard	Medium	Medium	✓
Hazardous Substances	Medium	Medium	✓
Severe Weather	High	Medium	✓
Severe Winter Weather	High	Medium	✓
Wildfire	Medium	Low	✓

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Prospect Park
Draft Adaptive Capacity

Name: FERNANDO NAVARRO Title and Agency DEPUTY OEM COORDINATOR

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	LOW NOT ENOUGH GENERATORS / SHELTER
Dam Failure	Medium	AGREE
Disease Outbreak	Medium	AGREE
Drought	Medium	AGREE
Earthquake	Medium	LOW NOT ENOUGH GENERATORS EQUIPMENT / SHELTER
Extreme Temperature	Medium	LOW NOT ENOUGH SHELTER
Flood	Medium	AGREE
Geological Hazards	Medium	AGREE
Hazardous Substances	Medium	AGREE
Severe Weather	Medium	LOW NOT ENOUGH GENERATORS / EQUIPMENT
Severe Winter Weather	High	LOW NOT ENOUGH GENERATORS / SHELTER
Wildfire	Medium	AGREE

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Prospect Park
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	AGREE
Dam Failure	Medium	Medium	Low	Low	AGREE
Disease Outbreak	Medium	Medium	Medium	Medium	AGREE
Drought	Medium	Medium	Medium	Medium	AGREE
Earthquake	Medium	Low	Medium	Low	AGREE
Extreme Temperature	Medium	Medium	Medium	Medium	AGREE
Flood	High	High	Medium	Medium	AGREE
Geological Hazard	Medium	Medium	Medium	Medium	AGREE
Hazardous Substances	Medium	Medium	Medium	Medium	AGREE
Severe Weather	High	Medium	High	Medium	AGREE
Severe Winter Weather	High	Medium	High	Medium	AGREE
Wildfire	Medium	Low	Low	Low	AGREE

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

City of Paterson
Draft Adaptive Capacity

Name: _____ Title and Agency Paterson

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	Medium
Dam Failure	Medium	Medium
Disease Outbreak	Medium	High
Drought	Medium	Medium
Earthquake	Medium	Low
Extreme Temperature	Medium	medium
Flood	Medium	Medium
Geological Hazards	Medium	
Hazardous Substances	Medium	High
Severe Weather	Medium	Medium
Severe Winter Weather	High	High
Wildfire	Medium	High

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

City of Paterson
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	RI
Dam Failure	Medium	Medium	Low	Low	Medium
Disease Outbreak	Medium	Medium	Medium	Medium	OK RI
Drought	Medium	Medium	Medium	Medium	~~OK~~
Earthquake	Medium	Low	Medium	Medium	OK
Extreme Temperature	Medium	Medium	Medium	Medium	OK
Flood	High	High	Medium	High	OK.
Geological Hazard	Medium	Medium	Medium	Medium	OK
Hazardous Substances	Medium	Medium	Medium	Medium	OK
Severe Weather	High	Medium	High	Medium	OK
Severe Winter Weather	High	Medium	High	Medium	OK
Wildfire	Medium	Low	Low	Low	OK.

Woodland Park dam will impact the City ↓ Impact to residents

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of North Haledon
Draft Adaptive Capacity

Name: ANTHONY CONFORTI Title and Agency NORTH HALEDON

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	~~High~~	MEDIUM
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

PLEASE LOWER TO MEDIUM, TOWN PURCHASED GENERATORS, OUTSOURCED TREE COMPANIES TO REMOVE LIMBS OVER WIRES. SERVICED DRAINAGE SYSTEMS.

Borough of North Haledon
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
				2020	
	2015	2020 Draft Update	2015	Based on Risk Assessment Results	Municipal Feedback
Coastal Storm	High	High	High	High	← MEDIUM
Dam Failure	Medium	Medium	Low	Low	N
Disease Outbreak	Medium	Medium	Medium	Medium	
Drought	Medium	Medium	Medium	Medium	
Earthquake	Medium	Low	Medium	Low	
Extreme Temperature	Medium	Medium	Medium	Medium	
Flood	High	High	Low	Low	
Geological Hazard	Medium	Medium	Medium	Medium	
Hazardous Substances	Medium	Medium	Medium	Medium	
Severe Weather	High	Medium	High	Medium	
Severe Winter Weather	High	Medium	High	Medium	
Wildfire	Medium	Low	Low	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

AC. O.K.

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

* BASED ON HISTORIC DATA, I FEEL THAT COASTAL STORM SHOULD BE @ MEDIUM RATHER THAN HIGH

Township of West Milford
Draft Adaptive Capacity

Name: MICHAEL MOSCATELLO Title and Agency DEPUTY OEM COORD WEST MILFORD

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	M
Dam Failure	Medium	M
Disease Outbreak	Medium	M
Drought	Medium	M
Earthquake	Medium	M
Extreme Temperature	Medium	M
Flood	Medium	M
Geological Hazards	Medium	M
Hazardous Substances	Medium	M
Severe Weather	Medium	M
Severe Winter Weather	High	H
Wildfire	Medium	M

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Township of West Milford
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
				2020	
	2015	2020 Draft Update	2015	Based on Risk Assessment Results	Municipal Feedback
Coastal Storm	High	High	High	High	M
Dam Failure	Medium	Medium	Medium	Medium	High
Disease Outbreak	Medium	Medium	Medium	Medium	M
Drought	Medium	Medium	Medium	Medium	M
Earthquake	Medium	Low	Medium	Low	M
Extreme Temperature	Medium	Medium	Medium	Medium	M
Flood	High	High	Medium	Medium	M
Geological Hazard	Medium	Medium	Medium	High	M
Hazardous Substances	Medium	Medium	Medium	Medium	M
Severe Weather	High	Medium	High	Medium	M
Severe Winter Weather	High	Medium	High	Medium	M
Wildfire	Medium	Low	Medium	Medium	M

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

Dam Failure High. Due to multiple High Hazard Dams
Aging Dams

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Township of Little Falls
Draft Adaptive Capacity

Name: DAN GIANSOSO Title and Agency COORDINATOR OEM

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	High	
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Township of Little Falls
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	D. ~~LOW~~
Dam Failure	Medium	Medium	Medium	Medium	D.
Disease Outbreak	Medium	Medium	Medium	Medium	D.
Drought	Medium	Medium	Medium	Medium	D.
Earthquake	Medium	Low	Medium	Medium	D.
Extreme Temperature	Medium	Medium	Medium	Medium	D. ME
Flood	High	High	High	High	D. [redacted]
Geological Hazard	Medium	Medium	Low	Low	D.
Hazardous Substances	Medium	Medium	Medium	Medium	D.
Severe Weather	High	Medium	High	Medium LOW	D. [redacted]
Severe Winter Weather	High	Medium	High	Medium LOW	D. [redacted]
Wildfire	Medium	Low	Low	Low	D.

~~NOTIFICATI~~ GENERATOR. STREAM CLEANI

HOUSE -RAISING DEMOLITIO NOTIFICATIO

DAM EQUIPMEN BRUMING

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Bloomingdale
Draft Adaptive Capacity

Name: MICHAEL HUDSON Title and Agency OEM COORDINATOR / Bloomingsdale

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity		
	Assumed for Draft	Jurisdiction Input	
Coastal Storm	Medium	✓	
Dam Failure	Medium	Low	LIMITED RESOURCES
Disease Outbreak	Medium	✓	
Drought	Medium	✓	
Earthquake	Medium	Low	LIMITED RESOURCES
Extreme Temperature	Medium	✓	
Flood	Medium	✓	
Geological Hazards	Medium	✓	
Hazardous Substances	Medium	✓	
Severe Weather	Medium	HIGH	ALERTS & RESOURCES AVAILABLE
Severe Winter Weather	High	✓	
Wildfire	Medium	✓	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Bloomingdale
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	✓ MEDIUM
Dam Failure	Medium	Medium	Medium	Medium	MEDIUM
Disease Outbreak	Medium	Medium	Medium	Medium	MEDIUM
Drought	Medium	Medium	Medium	Medium	MEDIUM
Earthquake	Medium	Low	Medium	Low	LOW
Extreme Temperature	Medium	Medium	Medium	Medium	MEDIUM
Flood	High	High	High	High	High
Geological Hazard	Medium	Medium	Low	Low	LOW
Hazardous Substances	Medium	Medium	Medium	Medium	MEDIUM
Severe Weather	High	Medium	High	Medium	MEDIUM
Severe Winter Weather	High	Medium	High	Medium	MEDIUM
Wildfire	Medium	Low	Medium	Medium	MEDIUM

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	Medium
Dam Failure	Medium	Medium	
Disease Outbreak	Medium	Medium	
Drought	Medium	Medium	
Earthquake	Medium	Low	
Extreme Temperature	Medium	Medium	
Flood	High	High	
Geological Hazard	Medium	Medium	
Hazardous Substances	Medium	Medium	
Severe Weather	High	Medium	
Severe Winter Weather	High	Medium	
Wildfire	Medium	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

1/23/20

Passaic County
Draft Adaptive Capacity

Name: Freeholder Bruce James Title and Agency Freeholder - Passaic County

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
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- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	✓
Dam Failure	Medium	✓
Disease Outbreak	Medium	✓
Drought	Medium	✓
Earthquake	Medium	✓
Extreme Temperature	Medium	✓
Flood	Medium	✓
Geological Hazards	Medium	✓
Hazardous Substances	Medium	✓
Severe Weather	Medium	✓
Severe Winter Weather	High	✓
Wildfire	Medium	✓

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	Medium
Dam Failure	Medium	Medium	
Disease Outbreak	Medium	Medium	
Drought	Medium	Medium	
Earthquake	Medium	Low	LOW
Extreme Temperature	Medium	Medium	
Flood	High	High	
Geological Hazard	Medium	Medium	
Hazardous Substances	Medium	Medium	
Severe Weather	High	Medium	
Severe Winter Weather	High	Medium	
Wildfire	Medium	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

1-23-20

Passaic County
Draft Adaptive Capacity

Name: Robert Lyons Title and Agency: Coord. Passaic County

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
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- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	✓
Dam Failure	Medium	✓
Disease Outbreak	Medium	✓
Drought	Medium	✓
Earthquake	Medium	✓
Extreme Temperature	Medium	✓
Flood	Medium	✓
Geological Hazards	Medium	✓
Hazardous Substances	Medium	✓
Severe Weather	Medium	✓
Severe Winter Weather	High	✓
Wildfire	Medium	✓

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =

[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	Medium - 49 [illegible] + buyouts
Dam Failure	Medium	Medium	Med
Disease Outbreak	Medium	Medium	Med
Drought	Medium	Medium	Med
Earthquake	Medium	Low	Med
Extreme Temperature	Medium	Medium	Med
Flood	High	High	Med
Geological Hazard	Medium	Medium	Med
Hazardous Substances	Medium	Medium	Med
Severe Weather	High	Medium	Med
Severe Winter Weather	High	Medium	Med
Wildfire	Medium	Low	Med

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Passaic County
Draft Adaptive Capacity

Name: Maria Dombeyc Title and Agency OEM - Passaic Co.

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	✓
Dam Failure	Medium	✓
Disease Outbreak	Medium	✓
Drought	Medium	✓
Earthquake	Medium	✓
Extreme Temperature	Medium	✓
Flood	Medium	✓
Geological Hazards	Medium	✓
Hazardous Substances	Medium	✓
Severe Weather	Medium	✓
Severe Winter Weather	High	✓
Wildfire	Medium	✓

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	Medium - Many buyouts - since Sandy + fence upgrades, generators, etc
Dam Failure	Medium	Medium	not
Disease Outbreak	Medium	Medium	not
Drought	Medium	Medium	not
Earthquake	Medium	Low	not
Extreme Temperature	Medium	Medium	not
Flood	High	High	not
Geological Hazard	Medium	Medium	not
Hazardous Substances	Medium	Medium	not
Severe Weather	High	Medium	not
Severe Winter Weather	High	Medium	not
Wildfire	Medium	Low	not

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Passaic County
Draft Adaptive Capacity

Name: Maryann Trommelen Title and Agency Dep. Coord. - Passaic Co. OEM

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	ok
Dam Failure	Medium	ok
Disease Outbreak	Medium	ok
Drought	Medium	ok
Earthquake	Medium	ok
Extreme Temperature	Medium	ok
Flood	Medium	ok
Geological Hazards	Medium	ok
Hazardous Substances	Medium	ok
Severe Weather	Medium	ok
Severe Winter Weather	High	ok
Wildfire	Medium	ok

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Adaptive Capacity

Name: _____Title and Agency_____

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	High	
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Passaic County
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'County Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		County Feedback
	2015	2020 Draft Update	
Coastal Storm	High	High	OK
Dam Failure	Medium	Medium	
Disease Outbreak	Medium	Medium	HIGH
Drought	Medium	Medium	
Earthquake	Medium	Low	
Extreme Temperature	Medium	Medium	
Flood	High	High	
Geological Hazard	Medium	Medium	
Hazardous Substances	Medium	Medium	
Severe Weather	High	Medium	HIGH
Severe Winter Weather	High	Medium	HIGH
Wildfire	Medium	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Township of Wayne
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020	
				Based on Risk Assessment Results	Municipal Feedback
Coastal Storm	High	High	High	High	
Dam Failure	Medium	Medium	Medium	Medium	
Disease Outbreak	Medium	Medium	Medium	Medium	
Drought	Medium	Medium	Medium	Medium	
Earthquake	Medium	Low	Medium	Medium	
Extreme Temperature	Medium	Medium	Medium	Medium	
Flood	High	High	High	High	
Geological Hazard	Medium	Medium	Low	Low	
Hazardous Substances	Medium	Medium	Medium	Medium	
Severe Weather	High	Medium	High	Medium	
Severe Winter Weather	High	Medium	High	Medium	
Wildfire	Medium	Low	Low	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Township of Wayne
Draft Adaptive Capacity

Name: Dan Daly Title and Agency: OEM Coordinator; Wayne

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	High → 50 member police marine unit, fire, EMS numerous boats. Flood buyout program very big. website/social media warnings
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	High - large police and fire depts. Parks+Rec tree division on-call to remove trees from roadways.
Severe Winter Weather	High	
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Wanaque
Draft Adaptive Capacity

Name: MICHAEL CRISTALDI Title and Agency WANAQUE BOROUGH ENGINEER

973 523 6200 MCRISTALDI@ALAIMOGROUP.COM

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	MEDIUM
Dam Failure	Medium	MEDIUM
Disease Outbreak	Medium	MEDIUM
Drought	Medium	MEDIUM
Earthquake	Medium	MEDIUM
Extreme Temperature	Medium	MEDIUM
Flood	Medium	MEDIUM
Geological Hazards	Medium	MEDIUM
Hazardous Substances	Medium	MEDIUM
Severe Weather	Medium	MEDIUM
Severe Winter Weather	High	LOW
Wildfire	Medium	AGREE

Ringwood Ave is a single route for side street detour streams close skyline drive and all traffic diverted to Ringwood Ave - Town mobil... of emergency vehicles & Police

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Wanaque
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	AGREE
Dam Failure	Medium	Medium	Medium	Medium	AGREE
Disease Outbreak	Medium	Medium	Medium	Medium	AGREE
Drought	Medium	Medium	Medium	Medium	AGREE
Earthquake	Medium	Low	Medium	Medium	AGREE
Extreme Temperature	Medium	Medium	Medium	Medium	AGREE
Flood	High	High	Medium	Medium	AGREE
Geological Hazard	Medium	Medium	Low	Low	AGREE
Hazardous Substances	Medium	Medium	Medium	Medium	AGREE
Severe Weather	High	Medium	High	Medium	AGREE
Severe Winter Weather	High	Medium	High	Medium	AGREE
Wildfire	Medium	Low	Medium	Medium	AGREE

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Hawthorne
Draft Adaptive Capacity

Name Rich McArdle Title and Agency OEM - Hawthorne

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	High	Medium
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Hawthorne
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	* Med
Dam Failure	Medium	Medium	Low	Low	Low
Disease Outbreak	Medium	Medium	Medium	Medium	Med
Drought	Medium	Medium	Medium	Medium	Med
Earthquake	Medium	Low	Medium	Medium	Low
Extreme Temperature	Medium	Medium	Medium	Medium	Med
Flood	High	High	Medium	Medium	Med
Geological Hazard	Medium	Medium	Low	Low	Low
Hazardous Substances	Medium	Medium	Medium	Medium	Med
Severe Weather	High	Medium	High	Medium	Med
Severe Winter Weather	High	Medium	High	Medium	Med
Wildfire	Medium	Low	Low	Low	Low

ok ok ok ok ok ok ok ok ok ok

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

* Moderate Evidence of Continual occurrences
Historic Data - Last Event was 2012.

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Woodland Park
Draft Adaptive Capacity

Name: GEORGE GALBRAITH Title and Agency W.P. OEM DIR.

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	OK
Dam Failure	Medium	OK
Disease Outbreak	Medium	OK
Drought	Medium	HIGH
Earthquake	Medium	OK
Extreme Temperature	Medium	HIGH
Flood	Medium	OK
Geological Hazards	Medium	OK
Hazardous Substances	Medium	OK
Severe Weather	Medium	HIGH
Severe Winter Weather	High	OK
Wildfire	Medium	HIGH

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Woodland Park
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
				2020	
	2015	2020 Draft Update	2015	Based on Risk Assessment Results	Municipal Feedback
Coastal Storm	High	High	High	High	
Dam Failure	Medium	Medium	Medium	Medium	
Disease Outbreak	Medium	Medium	Medium	Medium	
Drought	Medium	Medium	Medium	Medium	
Earthquake	Medium	Low	Medium	Low	
Extreme Temperature	Medium	Medium	Medium	Medium	
Flood	High	High	High	High	
Geological Hazard	Medium	Medium	Medium	Medium	
Hazardous Substances	Medium	Medium	Medium	Medium	
Severe Weather	High	Medium	High	Medium	
Severe Winter Weather	High	Medium	High	Medium	
Wildfire	Medium	Low	Low	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Totowa
Draft Adaptive Capacity

Name: Rich Schoppert Title and Agency Fire Marshal / Totowa

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	Medium	
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	High	
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Totowa
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020	
				Based on Risk Assessment Results	Municipal Feedback
Coastal Storm	High	High	High	High	RS
Dam Failure	Medium	Medium	Low	Low	RS
Disease Outbreak	Medium	Medium	Medium	Medium	RS
Drought	Medium	Medium	Medium	Medium	RS
Earthquake	Medium	Low	Medium	Medium	RS
Extreme Temperature	Medium	Medium	Medium	Medium	RS
Flood	High	High	High	High	RS
Geological Hazard	Medium	Medium	Medium	Medium	RS
Hazardous Substances	Medium	Medium	Medium	Medium	RS
Severe Weather	High	Medium	High	Medium	RS
Severe Winter Weather	High	Medium	High	Medium	RS
Wildfire	Medium	Low	Low	Low	RC

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

City of Passaic
Draft Adaptive Capacity

Name: Rituash Patel Title and Agency OEM Coordinator City of Passaic

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	OK
Dam Failure	Medium	OK
Disease Outbreak	Medium	OK
Drought	Medium	OK
Earthquake	Medium	OK
Extreme Temperature	Medium	OK
Flood	Medium	OK
Geological Hazards	Medium	OK
Hazardous Substances	Medium	OK
Severe Weather	Medium	OK
Severe Winter Weather	High	OK
Wildfire	Medium	OK

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

City of Passaic
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	OK
Dam Failure	Medium	Medium	Low	Low	OK
Disease Outbreak	Medium	Medium	Medium	Medium	OK
Drought	Medium	Medium	Medium	Medium	OK
Earthquake	Medium	Low	Medium	Medium	OK
Extreme Temperature	Medium	Medium	Medium	Medium	OK
Flood	High	High	Medium	High	OK
Geological Hazard	Medium	Medium	Medium	Medium	OK
Hazardous Substances	Medium	Medium	Medium	Medium	OK
Severe Weather	High	Medium	High	Medium	OK
Severe Winter Weather	High	Medium	High	Medium	OK
Wildfire	Medium	Low	Low	Low	OK

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

Borough of Pompton Lakes
Draft Adaptive Capacity

Name: _____Title and Agency_____

Please indicate your jurisdiction's adaptive capacity in the table below.

Adaptive Capacity - Adaptive capacity describes a jurisdiction's current ability to protect from or withstand a hazard event.

- **Low** for adaptive capacity means the jurisdiction does not have the capability to effectively respond, which leads to an increase in vulnerability. Examples include weak/outdated/inconsistent plans, policies, codes/ordinances in place; no redundancies; limited to no deployable resources; limited capabilities to respond; long recovery.
- **Medium** means minimum requirements are in place; moderate capabilities; mitigation measures are identified but not implemented widespread; jurisdiction can recover but needs outside resources.
- **High** adaptive capacity means the jurisdiction does have the capability to effectively respond, plans/policies exceed minimum requirements; deployable resources all of which decreases vulnerability.

Hazard	Adaptive Capacity	
	Assumed for Draft	Jurisdiction Input
Coastal Storm	Medium	
Dam Failure	Medium	
Disease Outbreak	Medium	
Drought	Medium	
Earthquake	Medium	
Extreme Temperature	Medium	
Flood	~~Medium~~	HIGH
Geological Hazards	Medium	
Hazardous Substances	Medium	
Severe Weather	Medium	
Severe Winter Weather	High	
Wildfire	Medium	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking in page 2.*

Borough of Pompton Lakes
Draft Hazard Ranking

Hazard Ranking Equation =
[Probability of Occurrence x 0.40] + [(Impact on Population x 3) + (Impact on Property x 2) + (Impact on Economy x 1) x 0.40] + [Adaptive Capacity x 0.10] + [Climate Change x 0.10]

Please complete the 'Municipal Feedback' column for your jurisdiction using the draft risk assessment results, 2015 hazard ranking, draft 2020 hazard ranking calculation, and your professional knowledge/experience working and living in the jurisdiction.

Hazard	Countywide		Municipality		
	2015	2020 Draft Update	2015	2020 Based on Risk Assessment Results	2020 Municipal Feedback
Coastal Storm	High	High	High	High	Low *
Dam Failure	Medium	Medium	Low	Low	
Disease Outbreak	Medium	Medium	Medium	Medium	
Drought	Medium	Medium	Medium	Medium	
Earthquake	Medium	Low	Medium	Medium	
Extreme Temperature	Medium	Medium	Medium	Medium	
Flood	High	High	High	High	
Geological Hazard	Medium	Medium	Low	Low	
Hazardous Substances	Medium	Medium	Medium	Medium	[redacted]
Severe Weather	High	Medium	High	Medium	
Severe Winter Weather	High	Medium	High	Medium	
Wildfire	Medium	Low	Low	Low	

*Note: *Adaptive capacity was assumed Medium for all hazards, with the exception of High for severe winter weather, to calculate the draft hazard ranking*
RA = Risk Assessment

High-ranked hazards will require at least one mitigation action in the 2020 HMP update.

* AGGRESSIVE TREE TRIMMING AND REMOVAL PROGRAM. VERY ACTIVE FLOOD ADVISORY BOARD ADDRESSING DESILTING AND DESNAGGING, DRAIN MAINTENANCE, HOME REMOVALS AND ELEVATIONS!

B.4 SWOO EXERCISE WORKSHEETS

At the January 2020 risk assessment meeting, Steering Committee and municipal representatives were asked to participate in a Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise focusing on the high ranked hazards. Next, meeting participants were asked to record their input on strengths, weaknesses, obstacles and opportunities for their community's high-ranked hazards. The following worksheets were submitted by meeting attendees capturing their SWOO for their community. If a municipality was not present at the risk assessment meeting or attended the meeting but did not submit a worksheet, their input was collected at individual local annex preparation meetings and reflected in their jurisdictional annex.

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: Dan Daly
Department/Agency: Wayne Township OEM
Jurisdiction: Wayne
Email: dalyd@waynetownship.com

Please identify the hazard of concern and list any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	Flood
S	Excellent response capabilities. Robust flood mitigation homebuyout program
W	Highly susceptible to flooding.
Ob	More money needed for buyouts. People in hazardous areas who won't take buyouts.
Opps	Seek more grant money for buyouts

Hazard:	Coastal Storms
S	Large police, fire, EMS agencies for response. DPW capable of removing fallen trees. Many residents have generators.
W	Many trees falling causing blocked roads, power outages, property damage. Traffic affected.
Ob	Getting JCP+L to commit resources to the swath of town for which they provide power.
Opps	Engage JCP+L in dialogue to increase their response to Wayne.

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: Rich Schopperth

Department/Agency: Boro of Totowa Fire Dept

Jurisdiction: Totowa

Email: rschopperth@Totowanj.org

Please identify the hazard of concern and list any **S**trengths, **W**eaknesses, **Ob**stacles, or **Opp**ortunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	Coastal ~~Floods~~ Storm
S	D.P.W. Police Fire } Response
W	Response from utility co's
Ob	
Opps	

Hazard:	Flood
S	Past experience All Dept's.
W	Street Drainage
Ob	Flood plain management within Tri-Town Area.
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: Michael Moscatello
Department/Agency: West Milford OEM
Jurisdiction: West Milford
Email: Fireoffice2@westmilford.org

Please identify the hazard of concern and list any **Strengths**, **Weaknesses**, **Obstacles**, or **Opportunities** regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	Flood
S	Response Debris MGT
W	Traing Flood Plan MGT Drainage
Ob	Funding
Opps	

Hazard:	Coastal Storm
S	Debris MGT Response Debris MGT
W	Power Restoration Drainage Clearance of Debris From Roadways
Ob	Funding
Opps	

Hazard:	Dam Failure
S	Response
W	Maintnance Enforcement ~~Funding~~
Ob	Funding
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: MICHAEL CRISTALDI Borough Engineer

Department/Agency: Wanaque Borough

Jurisdiction: Wanaque

Email: MCRISTALDI@A-LAIMOGROUP.COM

Please identify the hazard of concern and list any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	FLOOD
S	FIRE DEPT PUMPS OUT BASEMENTS - LOCAL AND short duration FLOODING
W	ONLY SO MANY FIRETRUCKS TO PUMP OUT BASEMENTS
Ob	FUNDING
Opps	MORE STREAM CLEANING AND ADDITIONAL PUMP EQUIPMENT

Hazard:	WINTER STORM
S	Ringwood Ave single route absorbs SKYLINE Drive TRAFFIC NO STRENGTHS
W	MANPOWER & ROADWAY DETOURS DON'T EXIST
Ob	manpower & equipments
Opps	FUNDING

Hazard:	~~COASTAL STORM~~ power outage Public Facilities
S	NO ADDITIONAL GENERATOR SO NO STRENGTH
W	LACK OF generators either fixed or mobile
Ob	FUNDING
Opps	Generators Available IF FUNDING IS AVAILABLE

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: FERNANDO NANGLES

Department/Agency: PROSPECT PARK OEM

Jurisdiction: BOROUGH OF PROSPECT PARK

Email:

Please identify the hazard of concern and list any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

1

Hazard:	COASTAL STORM
S	GOOD ALARM SYSTEM RAPID RESPONSE POLICE/ FIRE / DPW
W	NOT ENOUGH EQUIPMENT NOT ENOUGH GENERATORS NOT ENOUGH SHELTER
Ob	ROADS BLOCKED, PERSONNEL PERSONNEL ABSENSE
Opps	POTENTIAL CREATION OF TEEN COURT

Hazard:	SEVERE WEATHER
S	GOOD ALARM SYSTEM SAME AS 1
W	SAME AS 1
Ob	SAME AS 1
Opps	SAME AS 1

Hazard:	EXTREME TEMPERATURE
S	GOOD ALARM SYSTEM RAPID RESPONSE / POLICE FIRE /DPW
W	NOT ENOUGH EQUIPMENT NOT ENOUGH GENERATORS NOT ENOUGH SHELTER
Ob	SAME AS 1
Opps	SAME AS 1

Hazard:	SEVERE WINTER TEMP
S	GOOD ALARM SYSTEM SAME AS 1
W	SAME AS 1
Ob	SAME AS 1
Opps	SAME AS 1

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: MIKE HUDSON

Department/Agency: OEM Bloomingdale

Jurisdiction: Bloomingdale

Email: oem@bloomingdalenj.net

Please identify the hazard of concern and list any **S**trengths, **W**eaknesses, **Ob**stacles, or **Opp**ortunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	COASTAL STORM
S	MUNICIPAL FACILITIES W/ GENERATORS
W	EQUIPMENT / BOATING
Ob	FUNDING to PURCHASE EQUIPMENT / LONG TERM OUTAGES
Opps	

Hazard:	FLOOD
S	MUNICIPAL FACILITIES W/ GENERATORS
W	EQUIPMENT / BARRIERS / BOATING
Ob	FUNDING BASED ON NEED FOR EQUIP
Opps	

Hazard:	SEVERE WEATHER
S	MUNICIPAL FACILITIES W/ GENERATOR ALERTING SYSTEM
W	Resources
Ob	LONG TERM Resources
Opps	FUNDING / Resources from GRANTS

Hazard:	SEVERE WINTER STORM
S	MUNICIPAL FACILITIES W/ GENERATOR. DPW STAFFED WELL W/ EQUIPMENT
W	
Ob	LONG TERM MAN-POWER
Opps	FUNDING / OPPORTUNITIES FROM COUNTY / STATE

* ALL AREAS have long term weakness for man power & Resources

~~NEW EQUIPMENT ALL PURCHASED FROM MUNICIPAL~~ FUNDING from FEMA

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: DAN GIANDUSO

Department/Agency: OEM

Jurisdiction: LITTLE FALLS

Email: DGIANDUSO@LFNJ.COM

Please identify the hazard of concern and list any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	Flooding
S	Boats, Equipment Mitigating RL Properties Brooks + Ditches Emergency Notifications
W	# of structures in the Flood Hazard area
Ob	Evacuations # of New houses in the Floodway
Opps	

Hazard:	Costal Storm
S	Tree limbs cut back Brooks + ditches maintained Generators Emergency notification
W	Power outages
Ob	Generators for local Gas Stations
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: ALBERT EVANGELISTA

Department/Agency: POMPTON LAKES OEM

Jurisdiction: POMPTON LAKES

Email: OEM@POMPTONLAKES-NJ.GOV

Please identify the hazard of concern and list any **S**trengths, **W**eaknesses, **Ob**stacles, or **Opp**ortunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	COASTAL STORM
S	~~POWER SUPPLY~~ PREPARDNESS
W	POWER SUPPLY
Ob	
Opps	

Hazard:	FLOOD
S	PREPARDNESS YEARLY RIVER MAINTENANCE TREE REMOVAL/DESIL- DESNAG
W	BRIDGE OBSTRUCTION
Ob	COUNTY OWNS BRIDGE
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: RICHARD McAULIFFE

Department/Agency: HAWTHORNE OEM

Jurisdiction: Borough of HAWTHORNE

Email: RMCAULIFFE@HAWTHORNEPDNJ.ORG

Please identify the hazard of concern and list any **S**trengths, **W**eaknesses, **Ob**stacles, or **Opp**ortunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Passaic County
2020 Hazard Mitigation Plan Update

Strengths, Weaknesses, Obstacles and Opportunities Worksheet

Name: ANTHONY CONFORTI

Department/Agency: NORTH HALEDON OEM

Jurisdiction: NORTH HALEDON

Email: - ACONFORTI@NORTHHALEDON.NJ.COM

Please identify the hazard of concern and list any Strengths, Weaknesses, Obstacles, or Opportunities regarding County and/or municipal capabilities to mitigating hazard impacts.

Hazard:	COASTAL STORM
S	GAINED EXPERIENCE DEBRIS PLANNING
W	UNDER STAFFED DURING STORM
Ob	~~FUNDING~~ DIFFICULTY W/ ~~GRANTS~~ GRANT WRITING
Opps	FUNDING / COUNTY OEM

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

Hazard:	
S	
W	
Ob	
Opps	

B.5 ANNEX REVIEW

Workshops and additional meetings (via in person, email and/or teleconference) to complete the jurisdictional annexes were held with the Steering and Planning Committees throughout the planning process. In preparation for the draft plan public review, each jurisdiction was asked to have their 'mitigation team' review their annex to ensure it was complete and accurate for posting to the Passaic County OEM's mitigation website.

In summary, all participating communities and the County completed the planning partner expectations and annex-preparation process. Details regarding these meetings are described further in Sections 2 (Planning Process) and 6 (Mitigation Strategy). Completed jurisdictional annexes are presented in Section 9. Emails or annex signature pages documenting annex review prior to submission to FEMA are included in this appendix.

Miskiman, Alison

From: Lyons PolAcad/OEM, Robert <robertl@passaiccountynj.org>
Sent: Wednesday, September 2, 2020 3:24 PM
To: Miskiman, Alison
Cc: Office of Emergency Management
Subject: County Annex - email needed
Attachments: Draft Section 9.1 - Passaic County.pdf

Good afternoon Alison,

The following individuals worked on, reviewed and approved the Passaic County's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Robert A. Lyons, County Coordinator
2. Maryann Trommelen, Deputy OEM Coordinator
3. Maria Dombayci, Deputy OEM Coordinator
4. Freeholder Bruce James, OEM Liaison
5. Jonathan Pera, County Engineer
6. Deborah Hoffman, Department of Planning and Economic Development
7. Mike Lysicatos, Director of Planning
8. Darryl Sparta, Department of Parks
9. Charlene Gungil, Department of Health

If you need any additional information please feel free to contact my office.

Thank you for your never ending assistance.

passaic COUNTY NEW JERSEY

Robert A. Lyons, Sr., Director/Coordinator
County of Passaic
Department of Public Safety
Office of Emergency Management
Office: 973-904-3621 Fax:: 973-904-3843
Address: PCCC Public Safety Academy
300 Oldham Road, Wayne, NJ 07470
passaiccountynj.org

Jurisdictional Annex Review Sign-Off Sheet

BLOOMINGDALE
MUNICIPALITY NAME

Mayor/Administrator

Name	Signature	Date
JON DUNLEAVY		3/16/20

Engineer

Name	Signature	Date
THOMAS Boorady		3/16/20

Fiscal/CFO

Name	Signature	Date
DONNA MCCLINTOCK		3/16/20

Building Code Official

Name / Title	Signature	Date
CHRIS WALTHOUR		3/16/20

Floodplain Administrator

Name / Title	Signature	Date
CHRIS WALTHOUR		3/16/20

Emergency Manager

Name / Title	Signature	Date
MICHAEL HUDSON		3/16/20

Land Use Planner

Name / Title	Signature	Date
		3/16/20

Public Works Director

Name / Title	Signature	Date
Albert Gallagher Superintendent		3/16/20

Police Department

Name / Title	Signature	Date
Police Chief Joseph Borell		3/16/20

Fire Department

Name / Title	Signature	Date
Fire Chief Eric Tuason		3/16/20

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Thursday, September 3, 2020 9:26 AM
To: Miskiman, Alison
Subject: FW: City of Passaic - Annex email needed

FYI

From: Walter Porto <cityofpassaicnj56@rcn.com>
Sent: Wednesday, September 02, 2020 10:20 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Cc: alison miskiman <alison.miskiman@tetratech.com>; Piyush Patel <ppatel@cityofpassaicnj.gov>; Walter Porto (oem-deputy@cityofpassaicnj.gov) <oem-deputy@cityofpassaicnj.gov>
Subject: Re: City of Passaic - Annex email needed

Director Lyons,

The following individuals worked on, reviewed and approved the City of Passaic's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Captain Piyush Patel, OEM Coordinator and Police Captain
2. Walter Porto, Deputy OEM Coordinator
3. Dennis Harrington, City Engineer and NFIP Floodplain Administrator
4. Fred Corbitt, Assistant Superintendent of DPW
5. Omar Garcia, Assistant Director of Finance
6. Amanda Curling, City Clerk
7. Hector C. Lora, Mayor
8. Ricardo Fernandez, Business Administrator/Land Use Planner
9. Luis Sanchez, Fire Official

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Wednesday, September 9, 2020 9:58 AM
To: Miskiman, Alison
Subject: FW: City of Clifton - Annex Review Email Needed

From: Onder, Mike <Monder@cliftonnj.org>
Sent: Wednesday, September 09, 2020 9:00 AM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Subject: RE: City of Clifton - Annex Review Email Needed

Director Lyons,

The following individuals worked on, reviewed and approved the City of Clifton's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Angelina Tirado, OEM Coordinator
2. Mike Onder, Deputy OEM Coordinator
3. Ron Laube, Deputy OEM Coordinator
4. Ernie Tedesco, Construction Official/NFIP Floodplain Administrator
5. Mayor James Anzaldi
6. Allan Ryff, Land Use Planner
7. Joe Kunz, Fiscal/CFO
8. Jason Vanwinkle, Public Works Director
9. Chief Thomas Rinaldi, Police Official
10. Frank Prezioso, Fire Official

Michael Onder,

Deputy OEM Coordinator
Clifton Fire Department
Office of Emergency Management
900 Clifton Ave
Clifton, N.J. 07013
973-470-5801
Monder@cliftonnj.org

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Wednesday, September 2, 2020 3:13 PM
To: Miskiman, Alison
Subject: FW: Borough of Haledon - Annex email needed

fyi

From: George Guzman <gguzman@Haledonpd.org>
Sent: Wednesday, September 02, 2020 2:51 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>; Mounir Almaita <malmaita@haledonboronj.com>
Cc: alison.miskiman@tetratech.com
Subject: Re: Borough of Haledon - Annex email needed

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Haledon's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Mounir Almaita, OEM Coordinator
2. Lt George Guzman, Deputy OEM Coordinator
3. Phil Cheff, Construction Official and NFIP Floodplain Administrator
4. Domenick Stampone, Mayor
5. Alan Susen, Borough Administrator
6. David Atkinson, Land Use Planner and Engineer
7. Steve Sanzari, Fiscal/CFO
8. Anthony Harrington, Public Works Foreman
9. Chief Angelo J. Daniele, Police Chief
10. Tom Bakker, Fire Chief

RICHARD S. GOLDBERG
Mayor

Department of Public Safety

Bureau of Police

Borough of Hawthorne, County of Passaic
445 Lafayette Avenue, Hawthorne, New Jersey 07506

RICHARD M. McAULIFFE
CHIEF OF POLICE

OFFICE OF THE CHIEF
973-427-1800

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Hawthorne's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Richard McAuliffe, OEM Coordinator
2. Brian Vanderhook, Deputy OEM Coordinator
3. Richard Stewen, Building Official and NFIP Floodplain Administrator
4. Richard s. Goldberg, Mayor
5. Eric Maurer, Borough Administrator
6. Laurie Foley /CFO
7. Robert scully Public Works Director
8. Steven Boswell, Engineer
9. James Knepper Police Captain
10. Gene DeAugustine, Fire Official

Thank you for your assistance in this matter.

Richard McAuliffe
Borough of Hawthorne OEM Coordinator

Director Lyons, 09/03/2020

The following individuals worked on, reviewed and approved the Township of Little Falls' annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Daniel D. Gianduso, OEM Coordinator

2. James DiMaria, Construction/Zoning Official and NFIP Floodplain Administrator

3 Thomas Lemanowicz, Aliamo Engineering

4. James Damiano, Mayor

5. Jeff Janota, Land Use Planner

6. Charles Cuccia, Fiscal/CFO

7. Phil Simone, Public Works Director

8. Steve Post, Chief of Police

9. James DiMaria, Fire Official

Sgt. Daniel D. Gianduso

Little Falls Emergency Management

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Tuesday, September 8, 2020 12:28 PM
To: Miskiman, Alison
Subject: FW: North Haledon

FYI

From: Anthony Conforti <AConforti@northhaledonnj.com>
Sent: Tuesday, September 08, 2020 12:09 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>; Todd Darby <TDarby@northhaledonnj.com>
Subject: North Haledon

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Woodland Park's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Chief Todd Darby, OEM Coordinator and Chief of Police
2. Lt. Anthony Conforti, Deputy OEM Coordinator and Lt. Police
3. Phillip Chef, Construction Official and NFIP Floodplain Administrator
4. Joe Pomante, Engineer, Boswell Engineering
5. Mayor Randy George
6. Renate Elatab, Borough Administrator
7. Chris Battaglia, Fiscal/CFO
8. Michael Kauker, Land Use Planner
9. Bill Graham, Public Works Director
10. Chief Todd Darby, Police Official
11. Jimmy Booth, Fire Official

Thank You,
Lieutenant Anthony Conforti #304
North Haledon Police Department
103 Overlook Avenue,
North Haledon NJ 07508
Work (973) 423-1111
Cell (973) 715-8888

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Tuesday, September 8, 2020 12:31 PM
To: Miskiman, Alison
Subject: FW: HMP Paterson

Importance: High

From: Libra Jones <ljones@patersonnj.gov>
Sent: Tuesday, September 08, 2020 12:13 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Cc: Troy Ayers <tayers@patersonnj.gov>
Subject: HMP Paterson
Importance: High

Director Lyons,

The following individuals worked on, reviewed and approved the City of Paterson's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Fred Margron, City Engineer
2. Jerry Lobozzo, Construction Official and NFIP Floodplain Administrator
3. Rhonda E. Thompson, OEM Coordinator (former)
4. Chief Gabriel Aboyoun, OEM Coordinator (former)
5. Elizabeth, Fornier, Deputy OEM Coordinator and Fire Official
6. Andre Sayegh, Mayor/Administrator
7. Michael Deutsch , Land Use Planner
8. Marge Cherone , Fiscal/CFO
9. William Rodriguez, Public Works Director
10. Chief Ibrahim Baycora , Police Official

Libra Jones
Paterson Office of Emergency Management
300 McBride Ave.
Paterson, NJ 07522
(973) 321-1410

~~~~~~
~~~~~~

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Thursday, September 10, 2020 11:12 AM
To: Miskiman, Alison
Subject: Borough of Pompton Lakes - Annex email needed

Below is the email from Pompton Lakes

From: Al Evangelista <oem@pomptonlakes-nj.gov>
Sent: Thursday, September 10, 2020 10:02 AM
To: Trommelen, Maryann <Maryannt@passaiccountynj.org>
Cc: dcottrell@pomptonlakespolice.org; William Baig <wbaig@pomptonlakes-nj.gov>; Kevin Boyle <administrator@pomptonlakes-nj.gov>; Michael Serra <mserra@pomptonlakes-nj.gov>
Subject: Borough of Pompton Lakes – Annex email needed

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Pompton Lake's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Albert Evangelista, OEM Coordinator
2. Kevin R. Boyle, Administrator
3. Sal Poli, Construction Official and NFIP Floodplain Administrator
4. Daniel O'Rourke, Public Works Director
5. Michael Serra, Mayor
6. Albert Bruno, Fire Official
7. Det. Sgt. Daniel Cottrell, Police Official & Deputy OEM Coordinator
8. Debra Lawlor (Masor Consulting), Land Use Planner
9. Paul Ferriero, Ferriero Engineering Inc.
10. Pompton Lakes Flood Advisory Board Members

Al Evangelista
OEM Coordinator

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Tuesday, September 8, 2020 8:51 AM
To: Miskiman, Alison
Subject: FW: Borough of Prospect Park - Annex email needed

FYI

From: Prospect Park OEM <ProspectParkOEM@prospectpark.net>
Sent: Tuesday, September 08, 2020 6:48 AM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Subject: Re: Borough of Prospect Park - Annex email needed

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Prospect Park's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Ariosto Rodriguez, OEM Coordinator
2. Bill Mullanaphy, Deputy OEM Coordinator
3. Yeisy Reyes, Jr., Deputy OEM Coordinator
4. Intashan Chowdhury, Administrator
5. Ken Valt, DPW Superintendent
6. Hana Hataf, Finance
7. Fastech Consulting - Farah Gilani, Engineer
8. Ricci Planning - Paul Ricci, Land Use Planner
9. James Booth, Fire Official
10. Captain Ammen Matari, Police Official

Borough of Prospect Park
Office of Emergency Management
106 Brown Avenue
Prospect Park, NJ 07508

Office: 973-790-7902 x 515
Fax: 973-790-6632

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Wednesday, September 2, 2020 2:54 PM
To: Miskiman, Alison
Subject: FW: Borough of Ringwood - Annex email needed

FYI

From: Scott Heck <sheck@ringwoodnj.net>
Sent: Wednesday, September 02, 2020 2:46 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>; Patrick Murray - Ringwood OEM (patmm1258@gmail.com) <patmm1258@gmail.com>
Cc: alison.miskiman@tetratech.com
Subject: RE: Borough of Ringwood - Annex email needed

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Ringwood's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Patrick Murray, Jr., OEM Coordinator
2. Scott Heck, Borough Manager/Director of DPW/ NFIP Floodplain Administrator
3. Sal Poli, Construction Official and NFIP Floodplain Administrator
4. Nicole Langenmayr, Borough Clerk
5. Jeff Yuhas, Engineer
6. Debbie Buchanan, CFO
7. Linda Schaefer, Mayor
8. Helen Forsa, Land Use Administrator
9. Don Devlin, Fire Official
10. Joseph Walker, Chief of Police

Scott Heck, CPWM
Borough Manager/Director of DPW
Borough of Ringwood
60 Margaret King Ave.
Ringwood, NJ 07456
Phone: 973-475-7101
Fax: 973-962-7001

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Friday, September 4, 2020 12:25 PM
To: Miskiman, Alison
Subject: FW: Totowa HMP Annex

FYI

From: rschopperth@totowanj.org <rschopperth@totowanj.org>
Sent: Friday, September 04, 2020 12:18 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Cc: 'Joseph Wassel' <jwassel@totowanj.org>
Subject: Totowa HMP Annex

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Totowa's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Allen Burghardt, Construction Official and NFIP Floodplain Administrator
2. James Niland, Public Works Superintendent
3. Joe Wassel, Borough Clerk
4. Rich Schopperth, Fire Official and Deputy OEM Coordinator
5. Lisa Nash, CMFO/Finance
6. Tom Lemanowicz, Borough Engineer-Alaimo Associates
7. Mayor John Coiro
8. Darlene Green, Land Use Planner-Maser Consulting
9. Carmen Veneziano, Police Chief

Should you require any further information, please feel free to contact my office.

Regards,

Chief Rich Schopperth
Rich Schopperth
Fire Marshal
Borough of Totowa
537 Totowa Road
Totowa, NJ 07512
(973) 956-1000 ext. 1013

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Tuesday, September 8, 2020 3:56 PM
To: Miskiman, Alison
Subject: FW: Borough of Wanaque - HMP

FYI
-----Original Message-----
From: Angelo Calabro <acalabro@wanaqueborough.com>
Sent: Tuesday, September 08, 2020 3:43 PM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Subject: RE: Borough of Wanaque - HMP

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Wanaque's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Angela Calabro, OEM Coordinator and Police 2. Michael Cristaldi, Engineer and NFIP Floodplain Administrator 3. Edward Schroeder, Deputy OEM Coordinator 4. Michael Brusco, Department of Public Works Superintendent 5. Marann Brindisi, CFO/Finance 6. Daniel Mahler, Mayor/ Paul Carelli Borough Administrator 7. Borough Engineer Mike Cristaldi Land Use Planner 8. Mark Olivieri , Fire Official

Capt. A. Calabro
Wanaque Police Patrol Division
973-835-5600
fax 973-835-6737
acalabro@wanaqueborough.com

Miskiman, Alison

From: Daly, Daniel <dalyd@waynetownship.com>
Sent: Wednesday, September 2, 2020 2:37 PM
To: Office of Emergency Management
Cc: Miskiman, Alison
Subject: RE: Township of Wayne - Annex email needed

The following individuals worked on, reviewed and approved the Township of Wayne's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Dan Daly, OEM Coordinator and Police Official
2. Heather Vitz-Del Rio, Director of Public Works and Township Engineer/NFIP Floodplain Administrator
3. Neal Bellet, Business Administrator
4. Joseph Albanese, Construction Official
5. Heather McNamara, CFO/Finance
6. Christopher Kok, Land Use Planner
7. Robert Minarick, Fire Official

Miskiman, Alison

From: Michael Moscatello (FireOffice2@WestMilford.org) <FireOffice2@westmilford.org>
Sent: Wednesday, September 2, 2020 2:45 PM
To: Office of Emergency Management; Edward Steines (FireComm@WestMilford.org)
Cc: Miskiman, Alison
Subject: RE: Township of West Milford - HMP Annex

Director Lyons,

The following individuals worked on, reviewed and approved the Township of West Milford's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. Michael Moscatello, Deputy OEM Coordinator
2. James Lupo, Zoning Official and NFIP Floodplain Administrator
3. Edward Steines, OEM Coordinator and DPW Director
4. Ellen Mageean, CFO/Finance
5. Charles, Engineer
6. Michele Dale, Mayor
7. Bill Senande, Township Administrator
8. Tim Ligus, Land Use Administrator
8. Michael Moscatello, Fire Official
9. James DeVore, Police Official / Chief of Police

Michael Moscatello, CFEI-CVFI
Fire Marshal
Deputy Emergency Management Coordinator
West Milford Township
1480 Union Valley Road
West Milford NJ 07480
Office: 973-728-2827
Fax: 973-728-2880

Miskiman, Alison

From: Office of Emergency Management <pcoem@passaiccountynj.org>
Sent: Wednesday, September 9, 2020 10:18 AM
To: Miskiman, Alison
Subject: FW: Woodland Park Hazard Mitigation Plan 2020

FYI

From: Galbraith, George <ggalbraith@wpnj.us>
Sent: Wednesday, September 09, 2020 10:08 AM
To: Office of Emergency Management <pcoem@passaiccountynj.org>
Subject: Woodland Park Hazard Mitigation Plan 2020

Director Lyons,

The following individuals worked on, reviewed and approved the Borough of Woodland Park's annex for the 2020 Passaic County and All Municipalities Hazard Mitigation Plan.

1. George Galbraith, OEM Coordinator and Director of Public Works
2. Kevin Galland, Administrator and Municipal Clerk
3. Allan Burghardt, Construction Code Official, Code Enforcement Officer, NFIP Floodplain Administrator
4. Heather Barkenbush CFO/Finance
5. Thomas Lemanowicz Alaimogroup Engineer
6. Keith Kazmark Mayor
7. Fire Official Michael Muccio
8. John Uzzalino Police Official

Any Question Please advise,

George Galbraith
Woodland Park OEM
Coordinator

DISCLAIMER: Any views expressed in this message are those of the individual sender, except where the sender specifies and with authority, states them to be the views of the managing agency. This e-mail and any attachments to it may contain confidential information and may be legally privileged. If you are not the intended recipient, you must not

APPENDIX C. MEETING DOCUMENTATION

Appendix C includes meeting agendas, sign-in sheets and meeting notes (where applicable and available) for meetings convened during the development of the Passaic County HMP update.

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Project Management Team Meeting – Agenda
August 1, 2019 at 9:30am

- Scope and Schedule
  - Brief review of our approved proposal
  - Plan approved by August 1, 2020
  - Copy of FEMA approval letter

- Municipal Participation – Letters of Intent to Participate

- Review Steering Committee Composition - refer to 2015 Steering Committee members

- Information and Data Collection
  - GIS Point of Contact for spatial data
    - Previous 2015 critical facility list
    - Lifelines – FEMA incorporating into mitigation
  - Point of Contact for reviewing Public Information (brochure/surveys/announcements)
    - Draft content for website update, newsletter, social media content, and public meeting announcements
  - Style Template for update

- Meeting Logistics
  - Schedule first Steering Committee meeting
  - Schedule HMP Kick-Off (public?)
    - Date and Location
    - Materials in multiple languages

- In-Kind Tracking
  - County can begin tracking all time with the development of RFP, reviews, meetings, this call etc.
  - Tetra Tech to track meeting attendance for all participants

PASSAIC COUNTY OFFICE OF EMERGENCY MANAGEMENT
HAZARD MIGIGATION PLAN UPDATE
INITIAL MEETING WITH VENDOR
THURSDAY, AUGUST 1, 2019
9am - 12 pm

NAME (please print)	AGENCY
1. Robert A. Lyons	P.C. OEM
2. Maryann Kommden	P.C. OEM
3. Alejandro Polanco	N.J.O.E.M.
4. Maria Dombayci	PC OEM
5. Alison Miskiman	Tetra Tech
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Steering Committee Meeting – Agenda
August 15, 2019 at 10:00am

Introductions

Scope and Schedule

- Brief review of our approved proposal
- Plan approved by August 2020

Steering Committee Role and Responsibilities

Information and Data Collection

- GIS Point of Contact for spatial data
    - Previous 2015 critical facility list
    - Lifelines – FEMA incorporating into mitigation
- Critical Facilities and Lifelines
    - *Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster.*
    - *A lifeline, a type of critical facility, enables the continuous operation of government functions and critical business and is essential to human health and safety or economic security.*

Review 2015 HMP

Public and Stakeholder Outreach

- English and Spanish
- County website - *updated*
- Brochure – *see draft options*
- Press release
- Social media content
- Citizen survey – *see draft*

Review Progress on 2015 County Mitigation Actions

In-Kind Tracking

Next Steps

- Attend Municipal Kick-Off – October 10, 2019
- Provide update on 2015 County mitigation actions

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Steering Committee Kick-Off Meeting
MEETING DATE: August 15, 2019

Name	Title	Agency/Municipality	Phone Number	E-mail
GEORGE GALBRAITH	WOODLAND PARK OEM DIR	WOODLAND PARK	973-256-1264	GGALBRAITH@WPNJ.US
Elizabeth Ward	Principal Planner	Passaic County	973-569-4045	eward@passaiccountynj.org
JONATHAN PETRA	COUNTY ENGINEER	PASSAIC COUNTY	973-881-4456	JONATHANP@PASSAICCOUNTYNJ.ORG
Maryann Trammell	Dep Coord	Passaic County	9739043621	maryannt@passaiccountynj.org
Richard A Lyons	Director	P.C. Dept. B.S	" "	" "
Maria Dambayci	Dep Coord	Passaic County OEM	9739043621	mariado@passaiccountynj.org
Alison Mistuman	Project Manager	TetraTech	973-630-8045	alison.mistuman@tetratech.com

Passaic County and All Municipalities Hazard Mitigation Plan Update
Meeting Notes

Purpose of Meeting:	Discuss the NJTPA Passaic River Basin Climate Resilience Plan
Location of Meeting:	Conference Call
Date of Meeting:	August 29, 2019

Attendees:

Alison Miskiman – Tetra Tech
Jennifer Fogliano – NJTPA

Agenda Summary:

Item No.	Description	Action item(s):
1	Introductions	
2	Asset Inventory = bridges, culverts, facilities, rail lines, roads, transit assets NJTPA GIS inventory and stakeholders input 1. Is the owner of each asset identified (whether county, municipal, etc. owned?) 2. What does the 'facilities' category include? 3. Source of assets? 4. Could this asset layer be shared for the HMP updates?	
3	Spatial data 1. Could we request the polygon and depth grids used for existing conditions, as well as the 2045 and 2080 projections and use in the HMP? CDM Smith sent CD-Roms of climate data 2. Flood Areas of Concern (identified by Technical Advisory Committee and HMPs) – spatial layer for our use? City of Newark and County interviews – Jennifer to look into this 3. Evacuation Routes – a. Collected and compiled available evacuation routes. Can this be shared? 4. Assets or Corridors Considered Critical to Operations of the Larger Transportation System – Gathered through Technical Advisory Committee questionnaires – is this spatially available? 5. Emergency Roadways – designated as serving an emergency function if within a quarter mile of an emergency facility – can this be shared? Jennifer will share all public files with us	NJTPA used a Travel Demand Model Zoomed into some areas in the Basin (some in Passaic County) most vulnerable to the different stressors caused by climate and mapped out if it was roadway, bridges, rail, etc. and which are vulnerable. 2045 based on current FEMA levels
4	Adaptation Strategies	

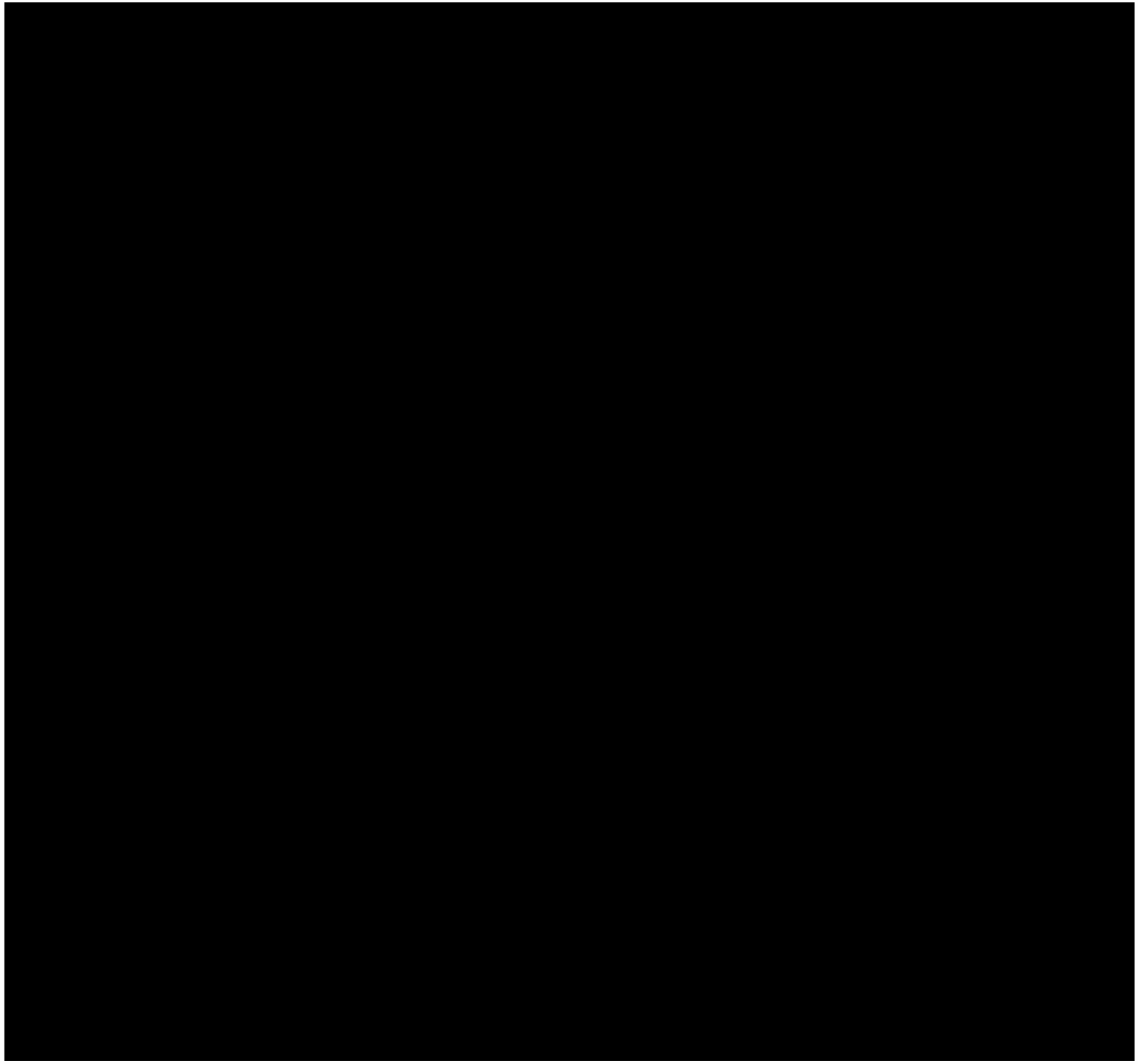
	1. There is an opportunity to review and integrate the identified adaptation strategies into the HMP updates if the County and municipalities have jurisdiction over the asset. a. What is the best way to go about this? b. Are the strategies asset specific? Are they separated by County? By asset-owner? c. Are there lead entities identified for each adaptation strategy? 2.	
5	Having reviewed the HMPs do you see other opportunities to integrate this work into Passaic, Essex, Morris and Hudson HMPs that are currently being updated? • Integrate into the O&M and Capital Programing Plans • Regional Operations Coordination Committee – recommendation to form this – see Plan recommendation to work together, do tabletops to keep conversations going	
6	Committee Members DOT – Just started an internal resiliency working group • Elkins Green – Director of Env Resources Division • John Richie – Environmental Specialist • Caroline Bursner	Jennifer to email me POCs from NJTPA committee for the Essex County Focus Group
7		
8		

SKYWARN Spotter Training on September 24, 2019 at 7:00pm Passaic County Public Safety Academy, 300 Oldham Road, Wayne NJ 07470

Name:	2. Last Name:
Craig	Abrams
Howard	Agriss
Howard	Agriss
Diane	Alimena
ROBERT	ANTONIUK
Aly	Badawy
Nancy C.	Beattie
J. Gordon	Beattie, Jr.
Daniel	Boggiano
mark	bohny
James	Bonacorda
James	Breheny
David	Bridges
Douglas	BRIDGES
Steven	Brodkowitz
Douglas	Brooks
Francis	Busby
Francis	Busby
ANTONIO	CARNEMOLLA
Gerardina	CARNEMOLLA
David	Charowsky
John	Charowsky
David	Charowsky
Gary	Charyak
Chris	Chiu
Amanda	Coffo
Shimaa	Darwish
Angela	DeFranco
Neil	Delucca
Cash	Dosby

[redacted]

Peter	Dougherty
michael	dowd
Joseph	Dunphy
Joseph	Dunphy
Ed	Efchak
Edward	EFCHAK
Christopher	Ellison
Leilani	Feliciano
Conor	Finneran
John	Fonseca
Susan	Frank
Karl	Frank
Daniel	Gianduso
David	Gotlib
Susan	Greco
Kurt	Greiner
Kurt	Greiner
Thomas	Guida
Paul	Haggerty
Mark	Hari
robert	herrmann
carolyn	herrmann
James	Hofbauer
Leah	Jaiman
Ria	Jairam
Ben	Jakubovic
George	Jones
Brandon	Kassner
Kevin	Klesitz
James	Koestler



Scott	Kooreman
Elizabeth	Kooreman
Joseph	Kurz
ANDREW	LANGE
ALAN	LASH
Cynthia	Livesey
Lorraine	Loza
Daniel	Manoni
Vivian	Marmaras
Christopher	Marrero
George	McCabe
Robert	merritt
Robert	merritt
Alison	Miskiman
Tony	Mondaro
Theresa Rose	Mondaro
Robert	Montagne
Joseph	Moor
Catherine	Murphy
Mordechai	Neuman
Kenneth	Nieglos
George	Olschewski
Brian	O'Malley
Michael	Oropeza
Kent	Owen
Marco	Pariente-Cohen
Susan	Paul
Michael	Pelar

	Michael	Phillips
	Cynthia	Reardon
✓	Rosalyn	Roimisher
	Steve	Rosman
✓	George	Sabbi
	Mark	Sacharoff
✓	JAMES	SADUR
✓	Victor	Scrivens
✓	Richard	Sefcik
	Beverly	Shimada
✓	Randy	Smith
	Randolph	Smith
	Robert	Smith
	Dennis	Steinerd
	Deborah	Steinhauser
✓	Gary	Steitz
✓	Daniel	Stratthaus
✓	Maryann	Trommelen
✓	Carlos L	Vazquez
✓	Nathaniel L	Vazquez
✓	Frank	Viglietta
✓	Steve	Wien
✓	Matthew	Willenborg
✓	EDWARD	WILSON
✓	Dee	Wood

[redacted]

Ed Seifert
Joyce Birmingham

BergenSkywarn Information

www.bergenskywarn.org

BergenSkywarn is the official National Weather Service handler for SKYWARN operations in both Bergen and Passaic counties in Northern New Jersey and other nearby areas if necessary. We operate amateur radio and Zello App SKYWARN Nets to collect and forward Spotter observations directly to the National Weather Service before and during local Severe Weather Events whenever possible. We also maintain a Website, a Facebook presence, a Twitter Feed and an Email News List. All are welcome to Subscribe or Follow us on any or all of these information systems.

Amateur Radio Frequency Information:

- FCC issued Amateur Radio Callsign: **WX2BC**
- Operations are on the W2PQG 2 meter amateur radio repeater located in Northern Bergen County
  - **146.700 Mhz, Negative 600k Khz Input Offset, PL 141.3**
    (Note this frequency is programmable into most Public Safety Scanners)

ZELLO App

- BergenSkywarn has a 2-Way Push To Talk Group at: **https://zello.com/BergenSkywarn**
- We monitor this 2-way Communications Application during MOST Severe Weather Events in or near Bergen and/or Passaic County.
- More information on the ZELLO App and system: **https://zello.com**
  - *(Zello Apps are available for Android, iPhone and Windows PC)*

Website:

- **www.bergenskywarn.org**

Facebook:

- **www.facebook.com/BergenSkywarn**

Twitter:

- **www.twitter.com/WX2BC (@WX2BC)**

Email List Subscriptions:

- Can be done from a Link on the BergenSkywarn Website or directly at:
  www.bergenskywarn.org/Pages/BergenSkywarnGroupSubscribe.htm

General Questions about BergenSkywarn or the SKYWARN Program can be sent via email to:

skywarn@bergenskywarn.org

PASSAIC COUNTY LEPC MEETING *PLEASE PRINT*	THURSDAY, September 26, 2019 @10 am	LOCATION: PSA RM. 122
NAME	***AGENCY***	***SIGNATURE***
Robert A Lyons	P.C. OEM	
Bruce James	PC Freeholder	
Maryann Trommelen	PC OEM	
Nancy Francesci	American Red Cross	
FRANK JACONETTA	NJ DMVC	
Alejandro Polanco	NJOEM NJSP	
Jack B. Kramer	Salvation Army	
Mike Wanklin	DC Fire Coord.	
John Reno	PHC	
Frank Irizarry	PHC	
Robert Flynn	JCPL	
Jim Castelane	JCPL	
Jose Ortiz	JCPL	
Bob Gordon	OEM CART	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Kick-off Meeting
MEETING DATE: Oct. 10, 2019

Name	Municipality
Rhonda E Thompson	Paterson
Fred Marcson	Paterson
PIYUSH PATEL	PASSAIC
WALTER PORRO	PASSAIC
Maryann Trommelen	PCOEM
Elizabeth Ward	Passaic County
Pat Murphy	Ringwood
Kevin Boyle	Passaic Cty
Heather Vitz-DeMo	Wayne
ANTHONY CONFORTI	NORTH HALEDON
MIKE CRISTADI	Wanaque NJ
James DeMaio	Little Falls
Sharon Brown	Wayne P.D.
Robert A Lyon	P-C OEM

Name	Municipality
Maria Dombayci	Passaic County
Michael Brucco	Wanaque DPW
Angelina Tirado	Clifton
Ron Lauber	Clifton
JACK SWEEZY JR.	LITTLE FALLS
DAN GOYANES	LITTLE FALLS
Brian Vanderhook	Hawthorne
Dan Daly	Wayne
Edward Murphy	P.C. OEM

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Kick Off Meeting
MEETING DATE: Oct. 10, 2019

Name	Municipality
Salvatore Presti	Passaic County Planning Dept.
FRED GERBITT	City of Passaic
JONATHAN PENA	PASSAIC COUNTY ENGINEER
[illegible]	POMPTON LAKES OEM
Michael WANKIW	PASSAIC Co. Fire Coordinator
Angelo Caldes	Wanaque OEM/Fire
Mike Ondus	Clifton
GEORGE GALBRAITH	WOODLAND PARK OEM.
Michael Moscatello	WEST MILFORD OEM
Lance Visone	NJOEM
Scott Heck	Ringwood
Kyle Snyder	Tt
Chris Hoch	Tt
Heather Apgar	Tt

Name	Municipality

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Patterson
MEETING DATE: 10/10/19

Name	Title	Agency/Municipality	Phone Number	E-mail
Fred Margron	City Engineer	Paterson	9733211320	fmargron@patersonnj.gov
Rhonda E Thompson	OEM Coordinator	Paterson	973-321-1410	rthompson@patersonnj.gov
Chris Huch	Planner	Tetra tech	973-630-8357	chris.huch@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Little Falls
MEETING DATE: 10/10/19

Name	Title	Agency/Municipality	Phone Number	E-mail
James DiMaria	Construction Flood Plain	Little Falls	973-766-2478	jdimaria@lfnj.com
DANIEL D. GIANDUSO	OEM	LITTLE FALLS	973-890-9268	DGIANDUSO@LFNJ.COM
Chris Huch	Planner	Tetra Tech	973-630-8357	chris.huch@tetratech.com

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Municipal Kickoff Meeting – Agenda
October 10, 2019 at 10:00am

Welcome and Opening Remarks: *Passaic County OEM*

Why is Hazard Mitigation Important? *Alison Miskiman, Project Manager, Tetra Tech*

Mitigation Planning Process: *Alison Miskiman, Project Manager, Tetra Tech*

Overview of the Current Plan: *Alison Miskiman, Project Manager, Tetra Tech*

Why is Municipal Participation Important? *Christopher Testa, Hazard Mitigation Unit Manager, NJ State Police, Office of Emergency Management – Recovery Bureau*

Strategies for Achieving Mitigation Goals: *Christopher Testa, Hazard Mitigation Unit Manager, NJ State Police, Office of Emergency Management – Recovery Bureau*

Participation Requirements and Timeline: *Alison Miskiman, Project Manager, Tetra Tech*

In-Kind Tracking

General Discussion/Q & A: *Alison Miskiman, Project Manager, Tetra Tech*

Next Steps: *Alison Miskiman, Project Manager, Tetra Tech*

- **1st Annex Meetings** (10/10/19; 10/11/19)
- **Risk Assessment Meeting – to be scheduled**

Wrap-up: *Passaic County OEM*

Contact Information

Tetra Tech: Alison Miskiman (alison.miskiman@tetratech.com; 973-630-8045)

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Municipal Annex Meeting for Ringwood
MEETING DATE: 10/10/19

Name	Title	Agency/Municipality	Phone Number	E-mail
Scott Heck	MANAGER	Ringwood	973-475-7101	sheck@ringwoodnj.net
Patrick M Murray	OEM	Ringwood	917 731 6658	PMMurray@AJMandSons.com
Alison Miskiman	Project Manager	TetraTech	973-630-8045	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Support Meeting
MEETING DATE: October 10, 2019 at 12:00-1:30am

Name	Title	Agency/Municipality	Phone Number	E-mail
Scott Heck	Borough Manager/ Director DPW	Borough of Ringwood	973-475-7101	sheck@ringwoodnj.net
Patrick Murray, Jr.	OEM Coordinator	Borough of Ringwood	917-731-6958	pmurray@pjmandsons.com
Alison Miskiman	Project Manager	Tetra Tech	973-630-8045	alison.miskiman@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Passaic
MEETING DATE: 10/11/19

Name	Title	Agency/Municipality	Phone Number	E-mail
Chris Huch	Planner	Tetra tech	973-630-8357	chris.huch@tetratech.com
FRED CORBITT	ASST. SUPT. DPW	city of Passaic	973-356-4964	fcorbitt@CityofPassaic.nj
Alberto M Ventura	Construction Official	City of Passaic	973 365 5521	AVENTURA@cityofPASSAICNJ.gov
WALTER PORRO	PASSAIC OEM	CITY OF PASSAIC	973-703-9814	OEM-DEPUTY@CityofPassaicNJ.Gov
DENNIS HARRINGTON	CITY ENGINEER	CITY OF PASSAIC	973 365 5524	dharrington@cityofpassaicnj.gov
Omar Garcia	Asst Dir. of Finance	City of Passaic	973-365-5577	ojgarcia@cityofpassaicnj.gov
Amada Curling	City Clerk	City of Passaic	973-365-5587	acurling@cityofpassaicnj.gov

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Pompton Lakes
MEETING DATE: 10/11/19

Name	Title	Agency/Municipality	Phone Number	E-mail
Albert Evangelista	OEM Coordinator	Pompton Lakes	973-583-2879	oem@pomptonlakes-nj.gov
Chris Huch	Planner	Tetra tech	973-630-8357	chris.huch@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Wayne
MEETING DATE: 10/11/19

Name	Title	Agency/Municipality	Phone Number	E-mail
Chris Huch	Planner	Tetra tech	973-630-8357	chris.huch@tetratech.com
Chris Kok	Township Planner	Wayne Twp	973-694-1800 x3265	Kokc@waynetownship.com
Dan Daly	OEM Coord.	Wayne Twp	973 633-3512	dalyd@waynetownship.com
Heather Vitzdelin	Director of Public Works	Wayne	973-694-1800 x3219	vitzdelinh@waynetownship.com

MORRIS COUNTY MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Woodland Park
MEETING DATE: 10/11/19

Name	Title	Agency/Municipality	Phone Number	E-mail
George Galbraith	OEM Director	Woodland Park	973 256-1264	ggalbraith@wpnj.us
Chris Huck	Planner	Tetra tech	973-630-8357	chris.huck@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC:
MEETING DATE:
11:30 - 12:30

Name	Title	Agency/Municipality	Phone Number	E-mail
Michael Moscatello	Deputy OEM Coord	West Milford OEM	973-349-7139	fireoffice2@westmilford.org

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Steering Committee Meeting – Agenda
December 10, 2019 at 10:00 – 11:00am

Project Status Update

Linkage Procedures – review and approve

Hazard Ranking Methodology – review and approve

Strengths, Weaknesses, Obstacles and Opportunities Exercise

In-Kind Tracking

Next Steps

- Mid-January: Steering Committee to review and approve 2020 HMP County hazard ranking – via email after document distributed
- January 23, 2020 Meeting at 10am: Review Risk Assessment (300 Oldham Road – Auditorium, Wayne, NJ)
- February 20, 2020 Meeting at 10am: Mitigation Strategy Workshop (300 Oldham Road – Auditorium, Wayne, NJ)

<u>Contact Information</u>

Tetra Tech: Alison Miskiman (alison.miskiman@tetratech.com; 973-630-8045)

Passaic County and All Municipalities Hazard Mitigation Plan Update
Meeting Notes

Purpose of Meeting:	Steering Committee
Location of Meeting:	Passaic County OEM, 300 Oldham Road, Wayne NJ
Date of Meeting:	December 10, 2019

Attendees:

See sign-in sheet

Agenda Summary:

Item No.	Description	Action item(s):
1	Project Status Update	
2	Linkage Procedures *Reviewed procedures and discussed what other New Jersey counties are doing. Decided to include linkage procedures to increase flexibility in the future but new participants cannot join the plan until after the 2020 HMP is approved by FEMA*	
3	Hazard Ranking Methodology *The methodology was reviewed and agreed to include Adaptive Capacity and Climate Change/Changing Future Conditions. However, propose to have Adaptive Capacity and Climate Change/Changing Future Conditions as 5% each in the formula. Tetra Tech to run the hazard ranking calculation with using 5% and 10% each to determine the changes. Steering Committee will decide via email on how to finalize formula or January 23rd risk assessment meeting.* *Maintain probability for all hazards of concern noted in the 2015 HMP* *Makes sense to have the following remain as high-ranked hazards: Coastal Storm, Flood, Severe Weather, Severe Winter Weather* *Final county hazard ranking will be decided via email by the Steering Committee to be presented at the January 23rd meeting*	
4	Strengths, Weaknesses, Obstacles and Opportunities Exercise *Reviewed the exercise and how to execute. The Steering Committee decided to distribute this via email in the new year to all plan participants to obtain feedback before the January 23rd risk assessment meeting. At the meeting, review the results and add to it if necessary.*	
5	Critical Facilities and Lifelines *The County reviewed these buildings and indicated changes were made.*	

	There is a new DPW building being constructed but currently unoccupied. This is included in the inventory.	
6	In-Kind Tracking	
7	Additional Topics Discussed *There will be a change in municipal coordinators in the new year for Prospect Park, Passaic and Totowa*	
8	Next Steps *Next meeting is on January 23rd and we have a double classroom. February 20 is the Mitigation Strategy Workshop – municipalities to stay afterward to meet with Tetra Tech planners; we have the auditorium*	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Steering Committee Meeting
MEETING DATE: December 10, 2019

Name	Title	Agency/Municipality	Phone Number	E-mail
Alison Miskiman	Project Manager	TetraTech	973-630-8045	alison.miskiman@tetratech.com
GEORGE GALBRAITH	OEM DIR	WOODLAND PARK	973-256-1264	GGALBRAITH@WPNJ.US
JONATHAN PETA	County Engineer	PASSAIC County	973-881-4456	JONATHANP@PASSAICCOUNTYNJ.ORG
Elizabeth Ward	Principal Planner	Passaic County- Planning Dept	975-569-4045	eward@passaiccountynj.org
Maryann Trammele	Dep. Coord.	Passaic County OEM	973-904-3621	Maryannt@passaiccountynj.org
Maria Dombayci	Dep. Coord.	Passaic County OEM	973-904-3621	mariado@passaiccountyNJ.org
ALFRED BATELLI	" "	" "	" "	ALFREDB@PASSAIC COUNTY.org
Rob A Lyon	Coordinator	"	"	pcoem@passaiccountynj.org

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Risk Assessment Review Meeting – Agenda
January 23, 2020 at 10:00am – 11:30am

Welcome and Opening Remarks

Project Status – *Where we are in the process; Public outreach*

Risk Assessment Overview

Hazard Ranking

SWOO (Strengths, Weaknesses, Obstacles and Opportunities) *related to impact of Highly-Ranked Hazards of Concern*

Development of Problem Statements

In-Kind Tracking

Next Steps

- February 20, 2020 Meeting at 10am – 12noon:
  - Mitigation Strategy Workshop (300 Oldham Road – Auditorium, Wayne, NJ)
  - Stay to develop actions and complete annexes with Tetra Tech planners

Project Contact Information

Tetra Tech: Alison Miskiman (alison.miskiman@tetratech.com; 973-630-8045)

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Risk Assessment Review
MEETING DATE: January 23, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Rich Schopperth	Fire Marshal	Totowa	973 956-1000 Ext1013	rschopperth@totowanj.org	Y
Rhonda Thompson	OEM Coord	Paterson	973 321-1410	rthompson@patersonnj	
Connor Gardner	Deputy Coord.	Paterson	973-495-9237	RGardner@patersonnj.gov	
Daniel Cottrell	Deputy Coor	Pompton Lakes	973-835-3992	DCOTTRELL@POMPTONLAKESPOLICE.org	
Alejandro Polanco	Region Rep	NJOEM	609-610-4377	LPP7524@gw.njsp.org	
GEORGE GALBRAITH	OEM DIR	WOODLAND PARK	973-256-1264	GGALBRAITH@WPNJ.US	
Angelo Calabro	Wanaque OEM	Wanaque	862-200-4121	acalabro@wanaqueborough.com	
FERNANDO NANGLES	OEM DEPUTY	PROSPECT PARK	201 679 5857	fnangles@gmail.com	
ALFRED BATELLI	[illegible]	PCOEM	973-904-[illegible]		B
WALTER BACCELLI	PASSAIC OEM	City of Passaic	973-703-9814		
FRED CORBITT	ASST SUPT. PASSAIC DPW	Passaic	973 356 4964	fcorbitt@cityofpassaic.gov	
Chris Gesualdo	NJSP / ERB	NJSP OEM	609-610-9132	lpp6985@gw.njsp.org	
PIYUSH PATEL	OEM COORD	PASSAIC	201 637 0141	ppatel@cityofpassaicnj.gov	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Risk Assessment Review
MEETING DATE: January 23, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Richard McAuliffe	OEM	Hawthorne	862-881-9640	RMCAULIFFE HAWTHORNENJ.org	Y
ALBERT EVANGELISTA	OEM COORD.	POMPTON LAKES	973-839-2877	OEM@POMPTONLAKES-NJ.gov	
WILLIAM D. BAIG	OEM ASST. COORD	Pompton Lakes	201-415-8472	wbaig@pomptonlakes-nj.gov wdbaig@hotmail.com	
GEO. GALBRAITH	OEM DIR.	WOODLAND PARK	973-256-1264	GGALBRAITH@WPNJ.US	
Michael Moscatello	Dep OEM Coord	West Milford	973-349-7139	Fireoffice2@westmilford.org	
OMAR Montanez	OEM Safety Coord	Passaic	862 5712584	OMARvibe701@gmail.com	
Kathleen M. Caren	Open Space Coord	Passaic County Planning	973-569-4049	kcaren@passaiccountynj.org	
Dan Daly	OEM Coord	Wayne	973 633-3512	daly@waynetownship.com	
Sharon Brown	OEM Secretary	Wayne	973 633-3520	brownse@waynetownship.com	
MIKE CRISTALDI	ENGINEER	WANAQUE	973 523 C200	MCRISTALDI@ALAIMO GROUP.com	
DAN GIANDUSO.	OEM COOR.	LITTLE FALLS	973-960 926		
Cameron Gardner	OEM Deputy Coor.	Paterson	9734959237	RGARDNER@paterson.gov	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Risk Assessment Review
MEETING DATE: January 23, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Robert A. Lyons	Director	PC OEM	973-904-3621	rl@pcnj.org	N
Bruce James	Freeholder	Passaic County	973 255-0891	BruceJJames2@gmail.com	
Maryann Tramonten	Dep. Coord	PC OEM	9739043621	maryann@passaiccountynj.org	
Maria Dombayci	Dep Coord	PC OEM	9739043621	mariad@passaiccountynj.org	
ALFRED BATELLI	"	"	"	ALFREDB@PassaicCountyNJ.org	
MICHAEL HUDSON	OEM Coord.	Bloomingdale	973-296-6010	oem@bloomingdalenj.net	
FERNANDO NANGLES	DEP COORD	PROSPECT PARK OEM	2016795857	fnangles@gmail.com	
JONATHAN PENA	County Engineer	Passaic County	973-881-4456	JonathanP@PassaicCountyNJ.org	
TOM DAESY	OEM COORD.	NORTH HALEDON	973-423-1111	TDAESY@NORTHHALEDONNJ.COM	
ANTHONY CONFORTI	OEM	NORTH HALEDON	973 423 1111	AConforti@NORTHHALEDONNJ.COM	N
Alison Miskiman	Project Manager	TetraTech	973-630-8045	alison.miskiman@tetratech.com	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Support Meeting
MEETING DATE: February 20, 2020 at 1:30pm – 4:00pm

Name	Title	Agency/Municipality	Phone Number	E-mail
George Galbraith	OEM Coordinator, DPW	Woodland Park	973-256-1264	ggalbraith@wpnj.us
Alison Miskiman	Project Manager	Tetra Tech	973-630-8045	alison.miskiman@tetratech.com

2/20/20
Passaic County Muni Support
8am - 9am

Name	Title	Muni	Signature
Mike Ader	Deputy OEM	Clifton	
WALTER PONTO	PASSAIC OEM	PASSAIC	

PASSAIC COUNTY HAZARD MITIGATION PLAN - 2020 UPDATE
Mitigation Strategy Workshop Meeting – Agenda
February 20, 2020 at 10:00am – 11:30am

Welcome and Opening Remarks

Project Status

Overview – Developing Mitigation Strategies

Breakout Working Groups to Develop Mitigation Strategies

- Review, Refine, Revise Problem Statements
- Consider Options
- Select Best Choice – write down the specific action selected
- Review Action Worksheet – complete as much as practical today
- Discuss Opportunities for Integrating mitigation into daily operations

Next Steps

- *Finalize Annexes – opportunity to stay after meeting to complete*
- *Final draft annexes due March 20 – send email confirmation ready to post for public review*
- *Annex sign-off sheets due April 2 – hard copy in folder; will be emailed*

Project Contact Information:

Alison Miskiman (Tetra Tech), 973-630-8045; alison.miskiman@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Mitigation Strategy Workshop
MEETING DATE: February 20, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Ariosto Rodriguez	coordinator	Prospect Park	754-226-7080	ProspectParkoem@ProspectPark.NET	
Fred Margron	City Engineer	Paterson	9733211320	Fmargron@patersonnjgov	
Michael A. Brusco	Superintendent	Wanaque	973-703-1725	mbrusco@wanaqueborough	
Howard Wolf	Planner	NJOEM	6095756202	HowardJWolf@yahoo.com	
MICHAEL HUDSON	COORDINATOR	Bloomingdale OEM	973-296-6010	oem@bloomingdalenj.net	
James DiMaria	Construction Official	Little Falls Twsp	973-256-6182	jdimaria@lfnj.com	
GEORGIS GALBRAITH	OEM DIR	WOODLAND PARK	9732561204	GGALBRAITH@WPNJ.US	
PATRICK MURRAY	OEM	Ringwood	9177316938	PMURRAY@RMANDS.COM	
ALFRED BATELLI	OEM	P.C.O.E.M	973-904-3621	ABATELLI@PASSAICCOUNTYNJ.ORG	
RICH McAULIFFE	OEM	HAWTHORNE	862-881-9140	RMCAULIFFE@HAWTHORNEPDNJ.org	
Robert A Lyons	PCOEM	Passaic County	9739043621	robertL@passaiccountynj.org	
Maryann Trommelen	PCOEM	Passaic County	9739043621	pcoem@passaicountynj.org	
Maria Dombayci	PCOEM	Passaic County	9739043621	pcoem@passaiccountynj.org	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Mitigation Strategy Workshop
MEETING DATE: February 20, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Sharon Brown	OEM SEC.	Wayne Twp	973 633-3520	sbrowns@waynetownship	
JONATHAN PENA	County ENGINEER	County	973-881-4451	JONATHANPE@passaicca.	
Elizabeth Fennick	OEM Deputy Coor.	Paterson FD	973-868 0493	EFournier@patersonnj.gov	
JON DUNLEAVY	MAYOR	BLOOMINGDALE	973 838 0778	jdunleavy@bloomingdalenj.net	
Albert Gallagher	Superintendent	Bloomingdale	973-296-4860	agallagher@bloomingdalenj.net	
Dan Daly	OEM Coord	Wayne	633-3512	dalyd@waynetownship.com	
George Guzman	Dep OEM Coord	Haledon	860 260 8832	gguzman@haledonnj.org	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Mitigation Strategy Workshop
MEETING DATE: February 20, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
ANTHONY CONFORTI	DEPUTY OEM	N.H.P.D	973 715 8888	ACONFORTI@NORTHHALEDONNJ.COM	
TODD DARBY	OEM COORD	N.H.P.D	973 800 5649	TDARBY@NORTHHALEDONNJ.COM	
[illegible]	OEM Coord.	Wanaque	973-835-[illegible]	[illegible]	
EDWARD [illegible]	Dep OEM Coord	WANAQUE	973 835-5000	[illegible]@WANAQUE.Com	
Katelynne Wolf	NJOEM - Mit		609-462-0128	LPPWOLFK@GW.NJSP.ORG	
ALBERT EVANGELISTA	COORDINATOR	POMPTON LAKES	973-583-2879	OEM@POMPTONLAKES-NJ.gov	Y

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Mitigation Strategy Workshop
MEETING DATE: February 20, 2020
**** Passaic County may take pictures during the meeting and include in the public plan.***

Name	Title	Agency/ Municipality	Phone Number	Email	Photo Release (Y/N)*
Michael Moscatello	Deputy OEM Coord	West Milford	973-728-2827	fireoffice2@westmilford.org	

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Support Meeting
MEETING DATE: February 20, 2020 at 8:00-9:30am

Name	Title	Agency/Municipality	Phone Number	E-mail
Scott Heck	Borough Manager/ Director DPW	Borough of Ringwood	973-475-7101	sheck@ringwoodnj.net
Patrick Murray, Jr.	OEM Coordinator	Borough of Ringwood	917-731-6958	pmurray@pjmandsons.com
Alison Miskiman	Project Manager	Tetra Tech	973-630-8045	alison.miskiman@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Support Meeting
MEETING DATE: February 20, 2020 at 12:00-1:30am

Name	Title	Agency/Municipality	Phone Number	E-mail
Michael Moscatello	OEM Coordinator	West Milford	973-728-2827	fireoffice2@westmilford.org
Alison Miskiman	Project Manager	Tetra Tech	973-630-8045	alison.miskiman@tetratech.com

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC:
MEETING DATE:

Name	Title	Agency/Municipality	Phone Number	E-mail
Michael A. Brusco	Superintendent	Wanaque	973-703-1725	mbrusco@wanaqueborough.com
Angelo Calabro	OEM/Police	Wanaque	973-835-5600	acalabro@wanaqueborough.com
MICHAEL CRISTALDI	BOROUGH ENGINEER	ALAIMO ENGINEERING CONSULTANT	973 523 6200	MCRISTALDI@ALAIMOGROUP.COM

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Completion Call
MEETING DATE: 8/11/2020 0.5 hours

Name	Title	Agency/Municipality	Phone Number	E-mail
Chris Huch	Planner	Tetra Tech	973-630-8357	Chris.huch@tetratech.com
Piyush Patel	Captain of Police	City of Passaic		ppatel@cityofpassaicnj.gov

PASSAIC COUNTY AND ALL MUNICIPALITIES HAZARD MITIGATION PLAN UPDATE
SIGN-IN SHEET
TOPIC: Annex Completion Call
MEETING DATE: 8/10/2020 0.5 hours

Name	Title	Agency/Municipality	Phone Number	E-mail
Chris Huch	Planner	Tetra Tech	973-630-8357	Chris.huch@tetratech.com
Gabe Aboyoun	Assistant Chief	City of Paterson		gaboyoun@patersonnj.gov

APPENDIX D. PUBLIC AND STAKEHOLDER OUTREACH

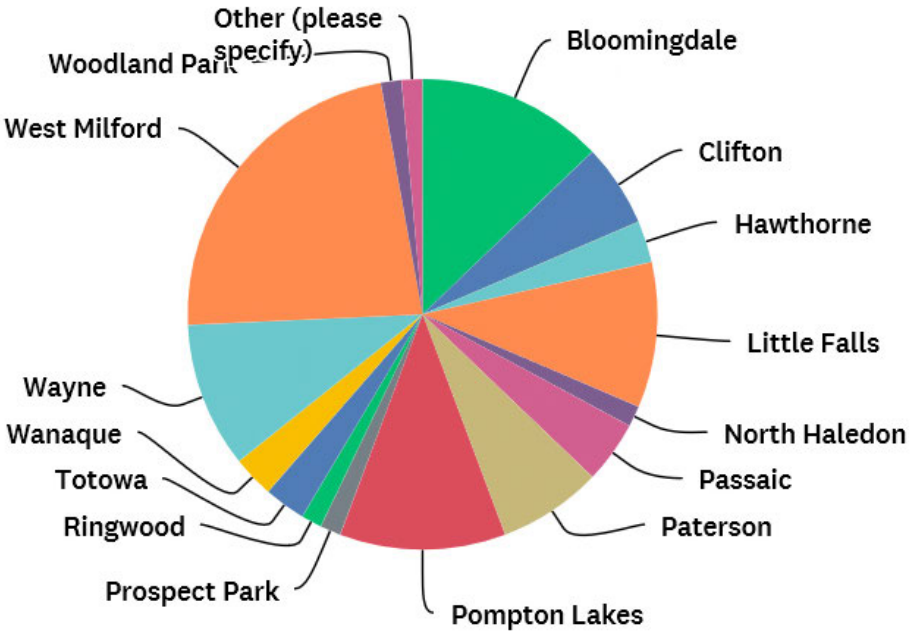
This appendix provides documentation of public and stakeholder outreach. Stakeholder involvement in this planning process was broad and productive as discussed and further documented in Section 2 (Planning Process). Public and stakeholder input has been incorporated throughout this HMP as appropriate, as identified in Section 2 and the References section, as well as within specific mitigation initiatives identified within the jurisdictional annexes (Section 9).

D.1 CITIZEN SURVEY

This section contains information and results gathered from the Passaic County Citizen Survey. The main objective of this survey was to gather information from citizens regarding their level of knowledge regarding hazard vulnerability and knowledge of hazard mitigation information for their local communities. The survey was available on the Passaic County OEM's HMP website beginning in the early fall of 2019. County departments and several municipalities also posted the survey on their websites and social media as shown in the figures below.

A total of 79 respondents completed this survey through June 2020. Respondents primarily consisted of individuals who have lived in Passaic County for 20 years or more and live in a single-family home. Survey respondents indicated they are most concerned regarding flooding, severe winter storms, severe weather. Survey respondents identified mitigation projects to reduce the effects of hazards include retrofit infrastructure; improve damage resistance to utilities and install and improve protective structures. The Citizen Survey results are included at the end of this appendix.

Figure D-1. Distribution of the Citizen Survey Responses



D.2 PUBLIC MEETINGS

All Planning Partnership meetings were open to the public. Meetings were advertised on the Passaic County OEM HMP website as well as through social media platforms. One resident attended the September 2019 Planning Partnership Kickoff meeting. This feedback was provided back to the County and municipalities to consider incorporation into the plan.

Passaic County OEM and the planning consultant attended the National Weather Service (NWS) SKYWARN Spotter training in September 2019 hosted at the Passaic County Community College Public Safety Academy. This training is open to the public and advertised on the NWS website as well as by the County. Over 50 residents from Passaic, Bergen and Essex Counties in New Jersey, and Rockland County New York were in attendance. Hard copies of the HMP brochure were distributed. At the beginning of the training, the HMP update was presented and information provided regarding the upcoming meetings and citizen survey. Several questions were asked by attendees, including residents from neighboring counties inquiring about their HMP update.

Figure D-2. Survey Invitation

passaic COUNTY NEW JERSEY

INVITATION TO PARTICIPATE IN SHAPING THE
PASSAIC COUNTY HAZARD MITIGATION PLAN
PLEASE RESPOND BY MAY 22, 2020

The County is updating its **Hazard Mitigation Plan** – see brochure below. Please help us plan for future disasters, **including pandemics like COVID-19**, by taking this survey to inform future preparedness and decision making. Thank you and be well. https://www.surveymonkey.com/r/Passaic2020_Business

For more information on this plan, please visit our project website: https://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

We understand this is a very challenging time and we greatly appreciate your participation in this survey. Stay well.

Thank you!

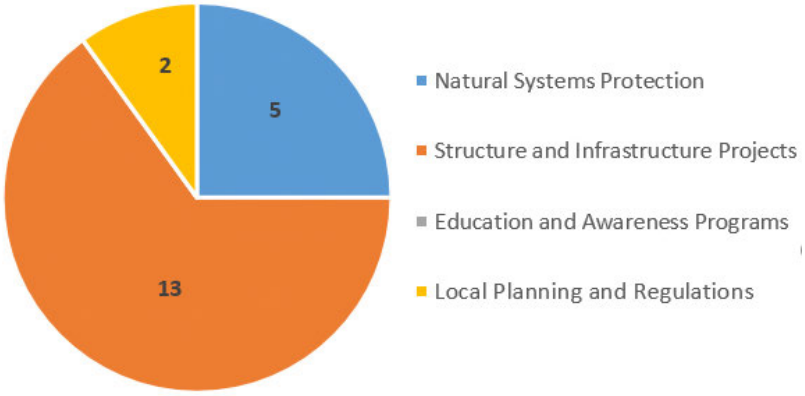
Deborah Hoffman
Director
Division of Economic Development
County of Passaic
Office: 973-569-4720
Mobile: 202-738-3038
deborahh@passaiccountynj.org

For Additional Information contact:

Alison Miskiman, MS, GISP, CFM
Mitigation and Resilience Technical Director
Direct: 973.630.8045 | Fax: 973.630.8025
alison.miskiman@tetratech.com

In addition, attendees were asked to 'vote' on their preferred mitigation projects to be implemented in Passaic County. Twenty (20) residents stopped by the mitigation table and participated in the survey selecting their preferred mitigation project type to reduce natural hazard risk. Overall, the majority of attendees selected structure and infrastructure mitigation projects. Refer to Figure D-3 for pictures of the meeting and the survey results.

Figure D-3. Resident Survey at the SKYWARN Training

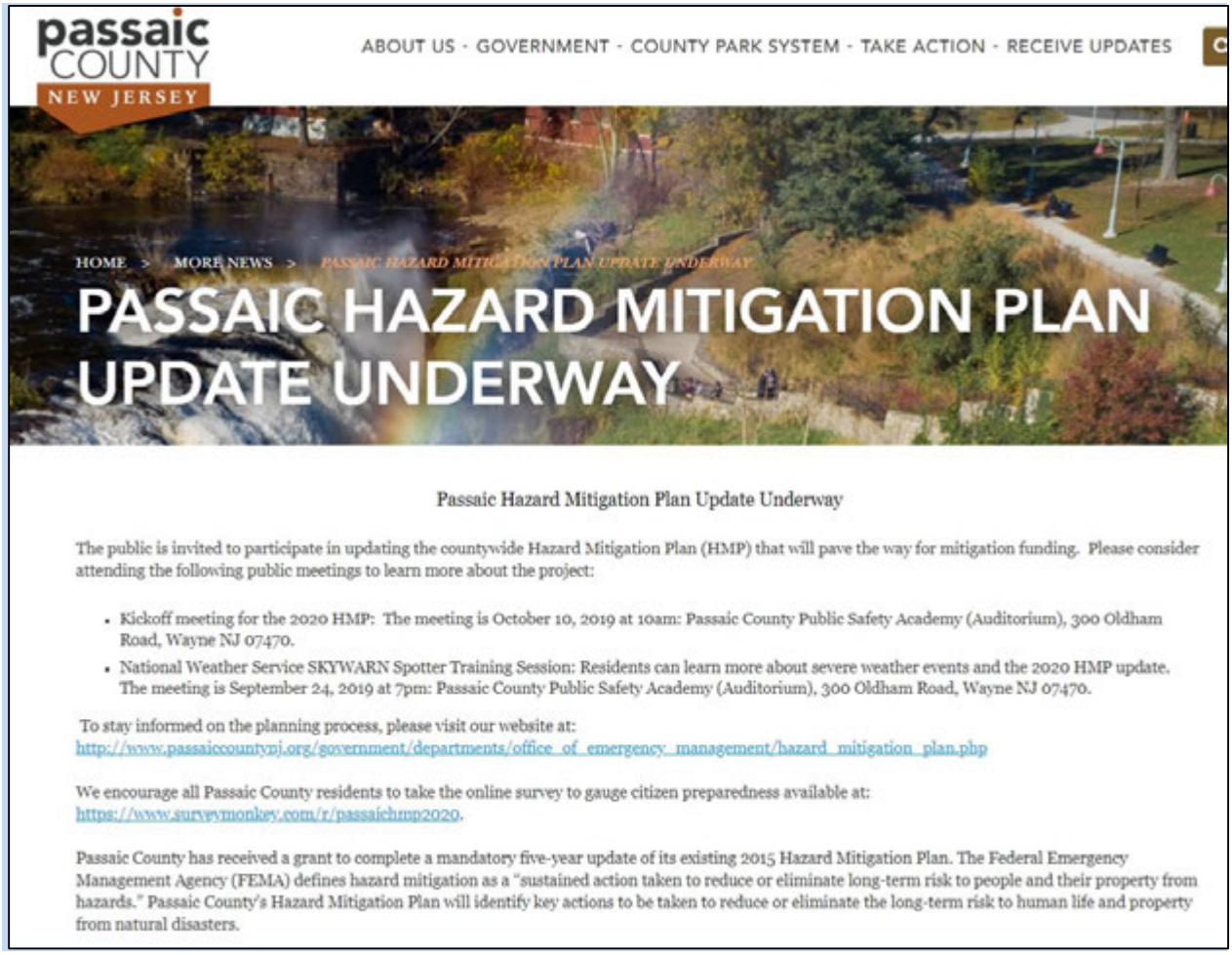


In February 2020, a public meeting was held in the Borough of Pompton Lakes hosted by the Flood Advisory Board. Numerous residents attended with standing-room only available. The HMP was presented and citizen survey distributed to meeting attendees as well as a discussion regarding the change in the flood maps.

D.3. PRESS RELEASE

Passaic County issued a press release to announce the commencement of the HMP update and invite residents to attend the kickoff meeting and take the citizen survey. Refer to Figure D-4 below.

Figure D-4. Passaic County Press Release



D.4 STAKEHOLDER SURVEYS

Passaic County distributed online surveys to stakeholders in an effort to gather additional capabilities, vulnerabilities and mitigation projects in the County and region. In order to gather that information during the COVID-19 pandemic, the surveys were sent to the following stakeholders: emergency services (law enforcement, firefighters, emergency medical services), transportation agencies and public works, business and commerce, hospitals and health care providers, social services, academia and utilities.

A total of 44 responses were submitted across the emergency services sector (fire, police, EMS, ambulance) and by local businesses; refer to Figure D-5. Results of the surveys are provided at the end of this appendix, with personal information redacted. A summary of entities that the surveys were distributed to, and those that responded may also be found in Section 2 (Planning Process).

Figure D-5. Number of Stakeholder Survey Responses by Sector

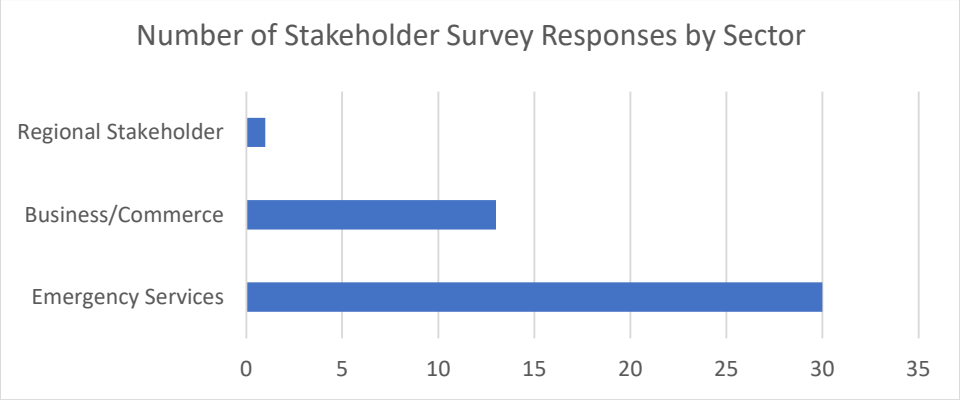


Table D-1 summarizes the state, regional and county entities these surveys were directly emailed to. In addition, Steering Committee members and the Planning Partnership were asked to assist with survey distribution. A detailed list of the local organizations the stakeholder surveys were distributed to is included in Section 2. A summary of stakeholder survey responses received are included at the end of this appendix.

Table D-1. State, Regional and County Entities Emailed the Stakeholder Survey Directly

Stakeholders Emailed the Surveys		
New Jersey Highlands Council	Rutgers University - State Climatologist - Edward J. Bloustein School - Transportation	North Jersey Transportation Planning Authority
Verizon	NJ Future	Passaic Valley Sewerage Commission
PSE&G	Sustainable Jersey	North Jersey District Waters Commission
JCP&L	NJ Transit	St. Joseph's Hospital
New Jersey American Water	NJDOT	American Red Cross
Passaic County Technical Vocational High School	Passaic County Community College	Salvation Army
All Chambers of Commerce	Passaic County Para Transit	Pompton Lakes Flood Advisory Committee
3,500 business contacts	William Paterson University	Passaic Valley Water Commission
Passaic County Senior Services	Passaic County Preakness Healthcare Center	Passaic County Animal Response Team

Stakeholders Emailed the Surveys		
New Jersey Board of Public Utilities		

D.4 WEBSITES, SOCIAL MEDIA AND NEWS ARTICLES

The following provides screenshots of websites, social media posts, news articles and other forms of public outreach.

Figure D-6. Passaic County HMP Website 1

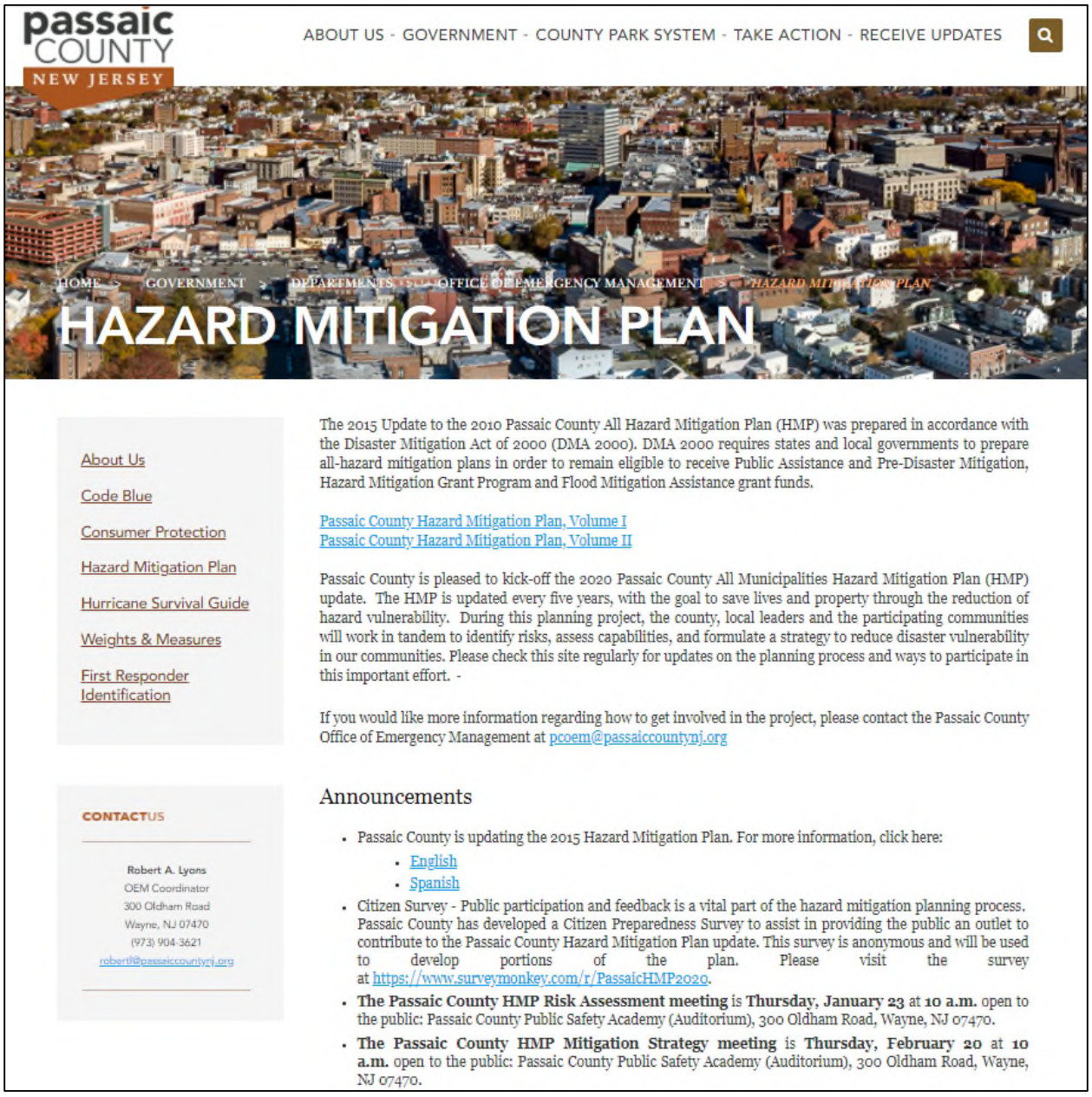
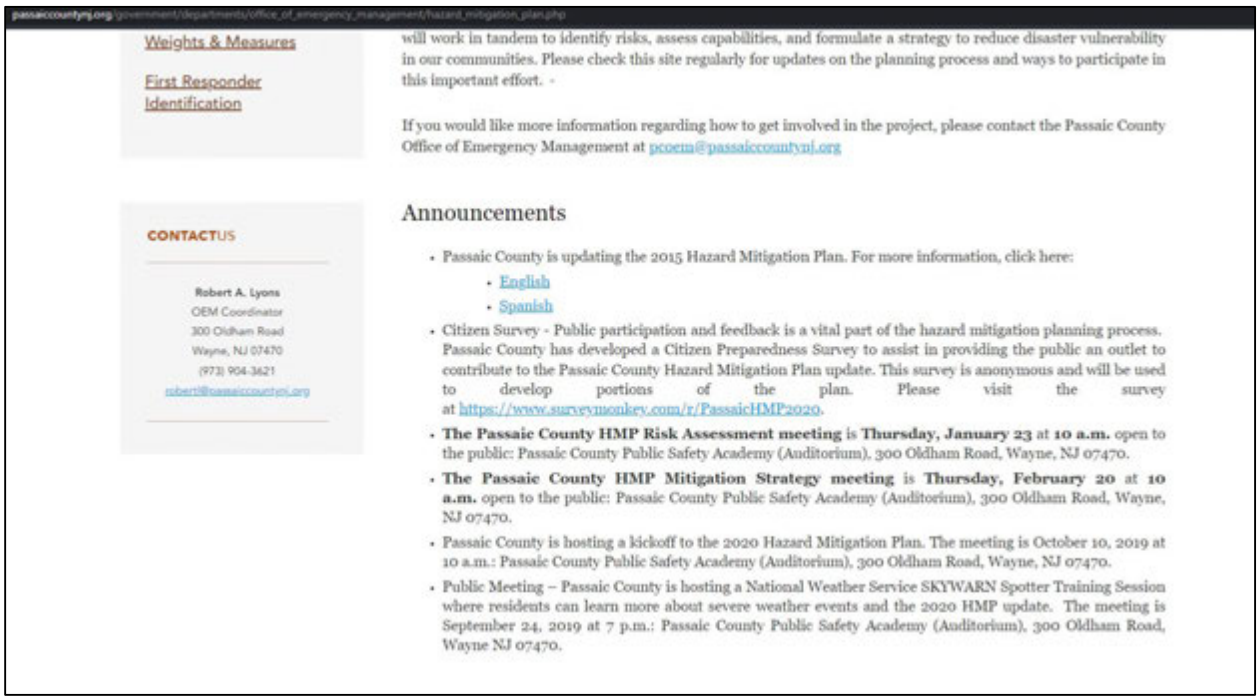


Figure D-7. Passaic County HMP Website 2



passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

Weights & Measures

First Responder Identification

will work in tandem to identify risks, assess capabilities, and formulate a strategy to reduce disaster vulnerability in our communities. Please check this site regularly for updates on the planning process and ways to participate in this important effort. -

If you would like more information regarding how to get involved in the project, please contact the Passaic County Office of Emergency Management at pcoem@passaiccountynj.org

CONTACTUS

Robert A. Lyons
OEM Coordinator
300 Oldham Road
Wayne, NJ 07470
(973) 904-3621
robert@passaiccountynj.org

Announcements

- Passaic County is updating the 2015 Hazard Mitigation Plan. For more information, click here:
  - English
  - Spanish
- Citizen Survey - Public participation and feedback is a vital part of the hazard mitigation planning process. Passaic County has developed a Citizen Preparedness Survey to assist in providing the public an outlet to contribute to the Passaic County Hazard Mitigation Plan update. This survey is anonymous and will be used to develop portions of the plan. Please visit the survey at https://www.surveymonkey.com/r/PassaicHMP2020.
- **The Passaic County HMP Risk Assessment meeting** is **Thursday, January 23** at **10 a.m.** open to the public: Passaic County Public Safety Academy (Auditorium), 300 Oldham Road, Wayne, NJ 07470.
- **The Passaic County HMP Mitigation Strategy meeting** is **Thursday, February 20** at **10 a.m.** open to the public: Passaic County Public Safety Academy (Auditorium), 300 Oldham Road, Wayne, NJ 07470.
- Passaic County is hosting a kickoff to the 2020 Hazard Mitigation Plan. The meeting is October 10, 2019 at 10 a.m.: Passaic County Public Safety Academy (Auditorium), 300 Oldham Road, Wayne, NJ 07470.
- Public Meeting – Passaic County is hosting a National Weather Service SKYWARN Spotter Training Session where residents can learn more about severe weather events and the 2020 HMP update. The meeting is September 24, 2019 at 7 p.m.: Passaic County Public Safety Academy (Auditorium), 300 Oldham Road, Wayne NJ 07470.

Figure D-8. Passaic County Hazard Plan Brochure – English Side 1

ENHANCING COUNTY AND LOCAL MITIGATION CAPABILITIES TO REDUCE HAZARD VULNERABILITIES IN PASSAIC COUNTY

PASSAIC COUNTY HAZARD MITIGATION PLAN

What is a Hazard Mitigation Plan?

A hazard mitigation plan (HMP) is "the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards" (44 CFR 201.6). HMPs establish and maintain eligibility for grant funds. The planning process is as important as the plan itself because it creates a framework for governments to reduce the negative impacts from future disasters on lives, property, and the economy.

Hazard mitigation planning can significantly reduce the physical, financial, and emotional losses caused by disasters. The Disaster Mitigation Act of 2000 is federal legislation that establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It encourages and rewards state and local pre-disaster planning and promotes sustainability. Completion of an HMP will result in more effective risk reduction projects and in a faster and more efficient allocation of funding.

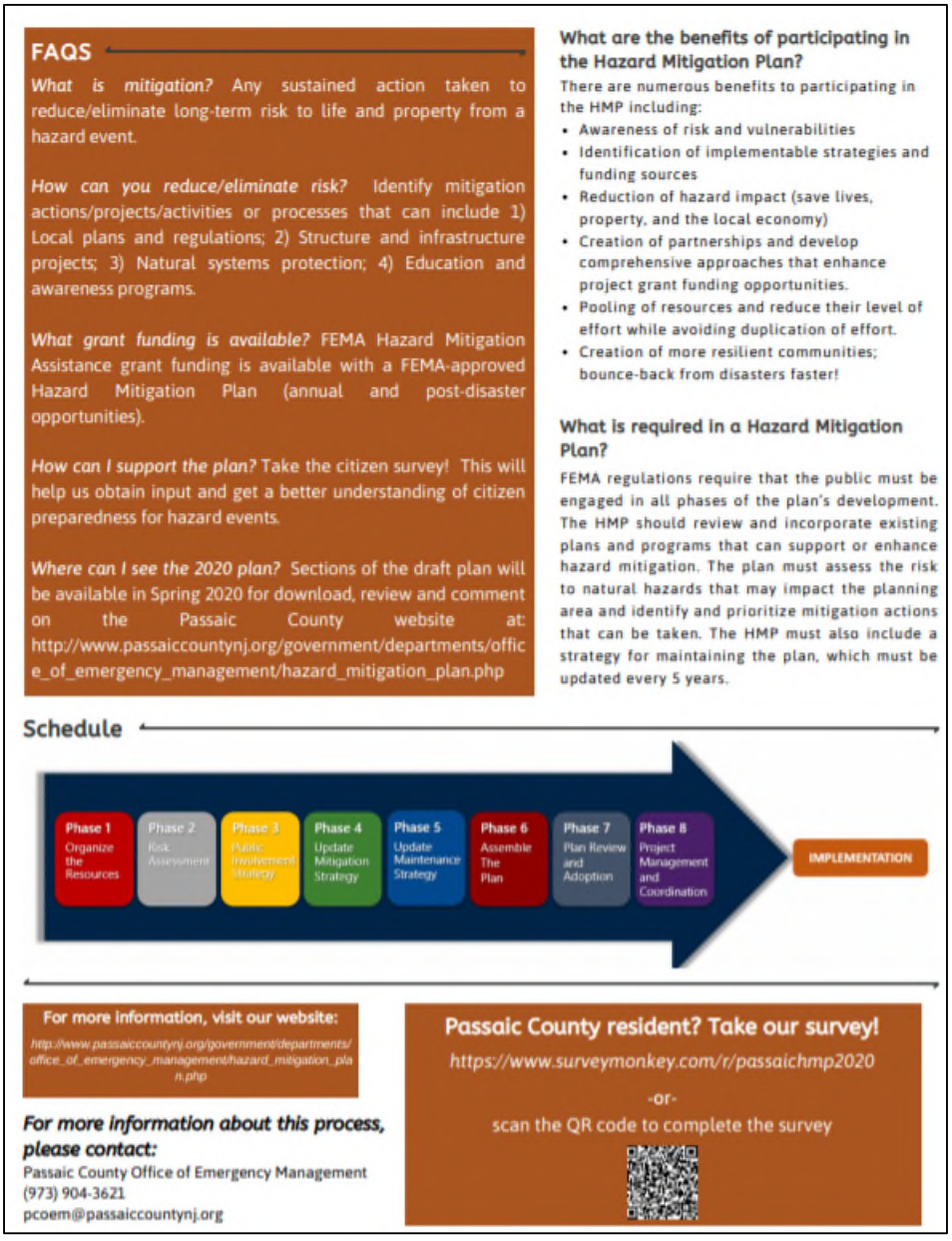
PURPOSE

The Passaic County Office of Emergency Management is leading the update of the countywide HMP. This plan is an opportunity to detail a variety of potential hazards that could affect some or all of our residents and will also allow the county and participating municipalities to be eligible for future mitigation funding from the Federal Emergency Management Agency (FEMA).

The goal of the plan is to identify projects that can reduce damages from future hazards. The plan will include a risk assessment and a hazard mitigation strategy. The primary natural hazards of concern in Passaic County include: Coastal Storm, Dam Failure, Drought, Earthquake, Extreme Temperature, Flood, Geologic Hazards, Severe Weather, Severe Winter Storm and Wildfire. In addition, the County is evaluating Hazardous Material and Disease Outbreak.

The study will focus on existing buildings and potential future development, infrastructure, and critical facilities that might be impacted. Critical facilities include but are not limited to municipal buildings and infrastructure such as power-generation facilities, water utilities, roadways, railroads and communication systems.

Figure D-9. Passaic County Hazard Plan Brochure – English Side 2



FAQS

What is mitigation? Any sustained action taken to reduce/eliminate long-term risk to life and property from a hazard event.

How can you reduce/eliminate risk? Identify mitigation actions/projects/activities or processes that can include 1) Local plans and regulations; 2) Structure and infrastructure projects; 3) Natural systems protection; 4) Education and awareness programs.

What grant funding is available? FEMA Hazard Mitigation Assistance grant funding is available with a FEMA-approved Hazard Mitigation Plan (annual and post-disaster opportunities).

How can I support the plan? Take the citizen survey! This will help us obtain input and get a better understanding of citizen preparedness for hazard events.

Where can I see the 2020 plan? Sections of the draft plan will be available in Spring 2020 for download, review and comment on the Passaic County website at: http://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

What are the benefits of participating in the Hazard Mitigation Plan?

There are numerous benefits to participating in the HMP including:

- Awareness of risk and vulnerabilities
- Identification of implementable strategies and funding sources
- Reduction of hazard impact (save lives, property, and the local economy)
- Creation of partnerships and develop comprehensive approaches that enhance project grant funding opportunities.
- Pooling of resources and reduce their level of effort while avoiding duplication of effort.
- Creation of more resilient communities; bounce-back from disasters faster!

What is required in a Hazard Mitigation Plan?

FEMA regulations require that the public must be engaged in all phases of the plan's development. The HMP should review and incorporate existing plans and programs that can support or enhance hazard mitigation. The plan must assess the risk to natural hazards that may impact the planning area and identify and prioritize mitigation actions that can be taken. The HMP must also include a strategy for maintaining the plan, which must be updated every 5 years.

Schedule

For more information, visit our website:

http://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

For more information about this process, please contact:

Passaic County Office of Emergency Management
(973) 904-3621
pcoem@passaiccountynj.org

Passaic County resident? Take our survey!

https://www.surveymonkey.com/r/passaichmp2020

-or-

scan the QR code to complete the survey

Figure D-10. Passaic County Hazard Plan Brochure – Spanish Side 1

MEJORAR LAS CAPACIDADES DE MITIGACIÓN LOCALES Y DEL CONDADO PARA REDUCIR LAS VULNERABILIDADES DE PELIGRO EN EL CONDADO DE PASSAIC

PLAN DE MITIGACIÓN DE RIESGOS DEL CONDADO DE PASSAIC

¿Qué es el Plan de Mitigación de Riesgos?

Un Plan de Mitigación de Riesgos (Hazard Mitigation Plan, HMP) es "la representación del compromiso de la jurisdicción para reducir riesgos ante peligros naturales, y sirve como guía para los encargados de la toma de decisiones mientras estos dedican recursos para reducir los efectos de peligros naturales" (Título 44 del Código de Regulaciones Federales [Code of Federal Regulations, CFR], Sección 201.6). Los HMP establecen y mantienen la elegibilidad para fondos de la subvención.

La planificación de la mitigación de riesgos puede reducir significativamente las pérdidas físicas, económicas y emocionales causadas por desastres. La Ley de Mitigación de Desastres del año 2000 es una legislación federal que establece un programa de mitigación de riesgos previo al desastre y los nuevos requisitos para el Programa de Subvención para Mitigación de Riesgos (Hazard Mitigation Grant Program, HMGP) nacional posterior al desastre. Incentiva y recompensa la planificación estatal y local previa al desastre y promueve la sostenibilidad. La realización de un HMP dará lugar a proyectos de reducción de riesgo más efectivos y a una asignación de fondos más rápida y eficiente.

PROPÓSITO

La Oficina de Manejo de Emergencias del Condado de Passaic lidera la actualización del HMP en todo el condado. Este plan es una oportunidad para detallar una variedad de riesgos potenciales que pudieran afectar a algunos de nuestros residentes o a todos, y también permite que el condado y las municipalidades participantes sean elegibles para recibir fondos de mitigación en el futuro por parte de la Agencia Federal para el Manejo de Emergencias (FEMA).

La meta del plan es identificar proyectos que puedan reducir daños de futuros peligros naturales. El plan incluirá una evaluación de riesgos y una estrategia de mitigación de peligros. Los principales riesgos naturales de preocupación en el Condado de Passaic incluyen: tormenta costera, falla de presas, sequía, terremoto, temperatura extrema, inundación, riesgos geológicos, clima severo, tormenta severa de invierno e incendios forestales. Además, el Condado está evaluando un brote de material peligroso y enfermedad.

El estudio se centrará en los edificios existentes y el desarrollo potencial futuro, la infraestructura e instalaciones vitales que pudieran verse afectadas. Las instalaciones vitales incluyen, entre otras, edificios e infraestructuras municipales, tales como instalaciones de generación de energía, servicios de agua, carreteras, ferrocarriles y sistemas de comunicación.

Figure D-11. Passaic County Hazard Plan Brochure – Spanish Side 2

PREGUNTAS FRECUENTES

¿Qué es mitigación? Es cualquier acción sostenida que se toma para reducir o eliminar riesgos a largo plazo para la vida y la propiedad a partir de un evento peligroso.

¿Cómo se pueden reducir o eliminar riesgos? Al identificar acciones, proyectos, actividades o procesos de mitigación que pueden incluir: 1) planes y regulaciones locales; 2) proyectos de estructura e infraestructura; 3) protección de sistemas naturales; 4) programas de educación y concientización.

¿Qué fondo de subvención está disponible? El fondo de subvención de Asistencia para la Mitigación de Riesgos de la FEMA está disponible con un Plan de Mitigación de Riesgos aprobado por la FEMA (oportunidades anuales y posteriores al desastre).

¿Cómo puedo apoyar el plan? ¡Participe en la encuesta ciudadana! Esto nos ayudará a obtener información y a comprender mejor la preparación de los ciudadanos para eventos peligrosos.

¿Dónde puedo ver el plan de 2020? Las secciones del borrador del plan estarán disponibles en la primavera de 2020 para descargar, revisar y comentar en el sitio web del Condado de Passaic en: http://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

¿Cuáles son los beneficios de participar en el Plan de Mitigación de Riesgos?

Existen numerosos beneficios al participar en el HMP, entre los que se encuentran:

- Conciencia de riesgos y vulnerabilidades
- Identificación de estrategias viables y fuentes de financiamiento
- Reducción del impacto del riesgo (salvar vidas, propiedades y la economía local)
- Creación de asociaciones y desarrollo de enfoques integrales que mejoren las oportunidades de financiamiento de subvenciones para proyectos.
- Reunión de recursos y reducción del nivel de esfuerzo evitando duplicación de esfuerzos.
- Desarrollo de comunidades más resilientes; ¡se recuperan más rápido de los desastres!

¿Qué se requiere en un Plan de Mitigación de Riesgos?

Las regulaciones de FEMA requieren que el público se involucre en todas las fases de desarrollo del plan. El HMP debe revisar e incorporar los planes y programas existentes que puedan apoyar o mejorar la mitigación de riesgos. El plan debe evaluar el riesgo de peligros naturales que puedan afectar el área de la planificación e identificar y priorizar las medidas de mitigación que se puedan tomar. El HMP también debe incluir una estrategia para mantener el plan, la cual debe actualizarse cada 5 años.

Programar

Para obtener más información, visite nuestro sitio web:

http://www.passaiccountynj.org/government/departments/office_of_emergency_management/hazard_mitigation_plan.php

Para obtener más información sobre este proceso, comuníquese con:

Oficina de Manejo de Emergencias del Condado de Passaic
(973) 904-3621
pcoem@passaiccountynj.org

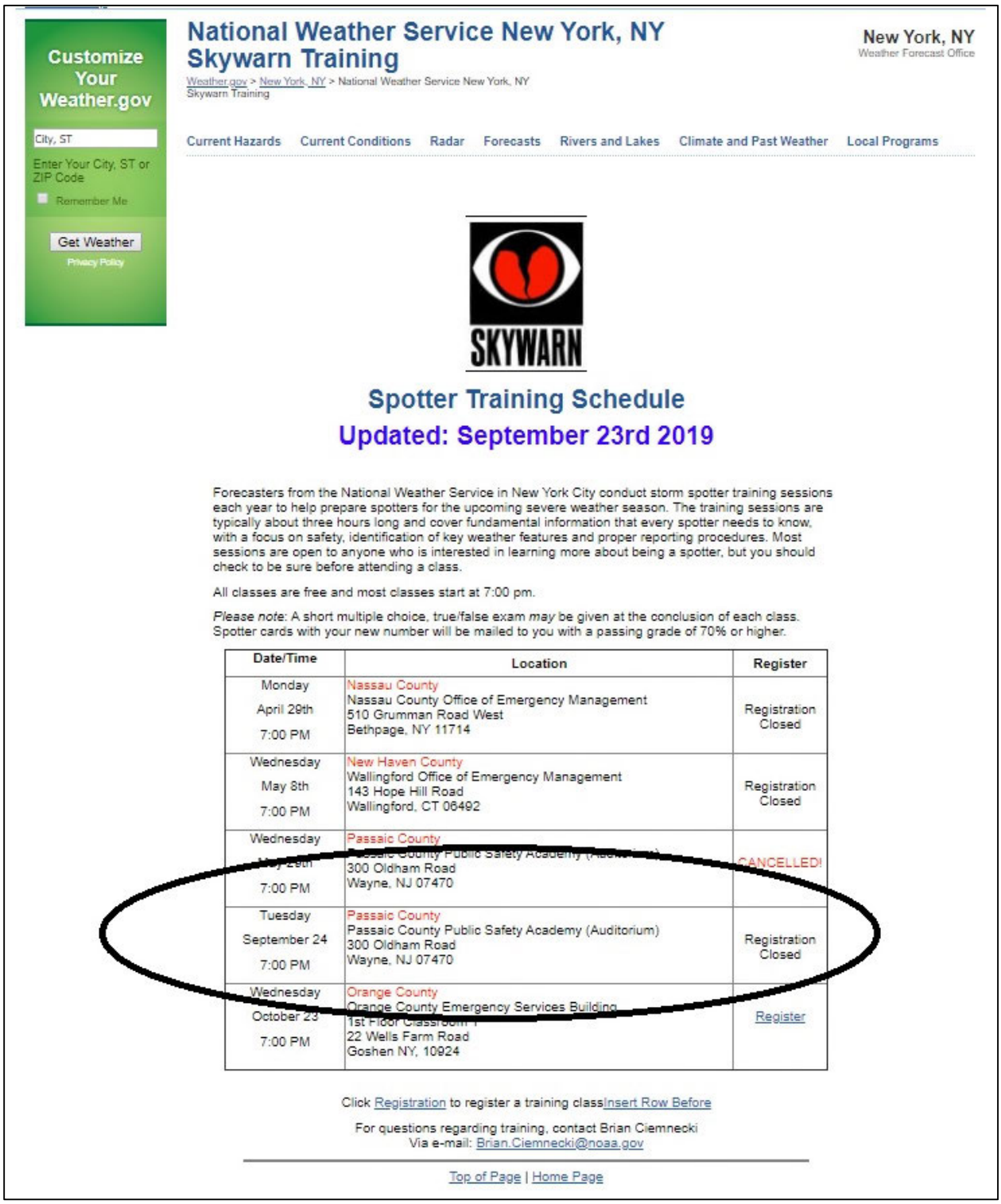
Residente del condado de Passaic? ¡Responde nuestra encuesta!

https://www.surveymonkey.com/r/passaichmp2020

-o-

escanee el código QR para completar la encuesta

Figure D-12. Skyward Training Session



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National Weather Service New York, NY
Skywarn Training

New York, NY
Weather Forecast Office

Weather.gov > New York, NY > National Weather Service New York, NY
Skywarn Training

Current Hazards | Current Conditions | Radar | Forecasts | Rivers and Lakes | Climate and Past Weather | Local Programs

SKYWARN

Spotter Training Schedule
Updated: September 23rd 2019

Forecasters from the National Weather Service in New York City conduct storm spotter training sessions each year to help prepare spotters for the upcoming severe weather season. The training sessions are typically about three hours long and cover fundamental information that every spotter needs to know, with a focus on safety, identification of key weather features and proper reporting procedures. Most sessions are open to anyone who is interested in learning more about being a spotter, but you should check to be sure before attending a class.

All classes are free and most classes start at 7:00 pm.

Please note: A short multiple choice, true/false exam *may* be given at the conclusion of each class. Spotter cards with your new number will be mailed to you with a passing grade of 70% or higher.

Date/Time	Location	Register
Monday April 29th 7:00 PM	Nassau County Nassau County Office of Emergency Management 510 Grumman Road West Bethpage, NY 11714	Registration Closed
Wednesday May 8th 7:00 PM	New Haven County Wallingford Office of Emergency Management 143 Hope Hill Road Wallingford, CT 06492	Registration Closed
Wednesday [illegible] 7:00 PM	Passaic County [illegible] 300 Oldham Road Wayne, NJ 07470	CANCELLED!
Tuesday September 24 7:00 PM	Passaic County Passaic County Public Safety Academy (Auditorium) 300 Oldham Road Wayne, NJ 07470	Registration Closed
Wednesday October 23 7:00 PM	Orange County Orange County Emergency Services Building 1st Floor Classroom 1 22 Wells Farm Road Goshen NY, 10924	Register

Click Registration to register a training classInsert Row Before

For questions regarding training, contact Brian Ciemnecki
Via e-mail: Brian.Ciemnecki@noaa.gov

Top of Page | Home Page

Figure D-13. Patterson Police Department

Figure D-14. Pompton Lakes Survey

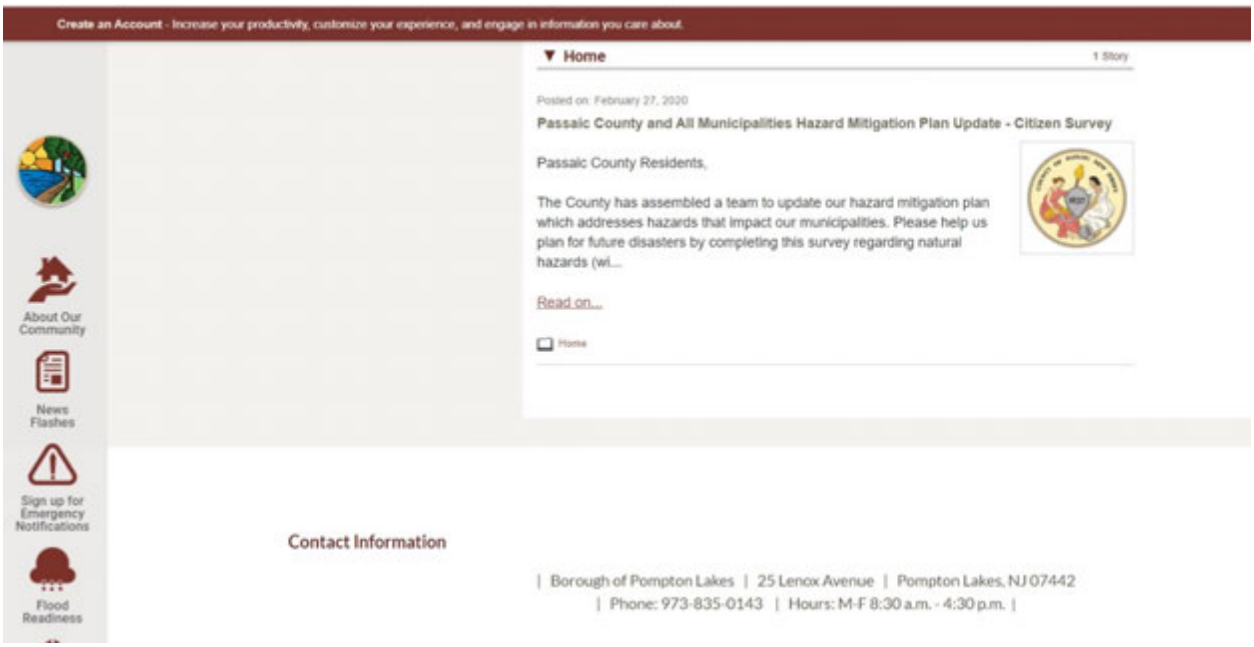

Figure D-15. Wanaque Borough Website

Figure D-16. Wanaque Borough Survey and Brochure

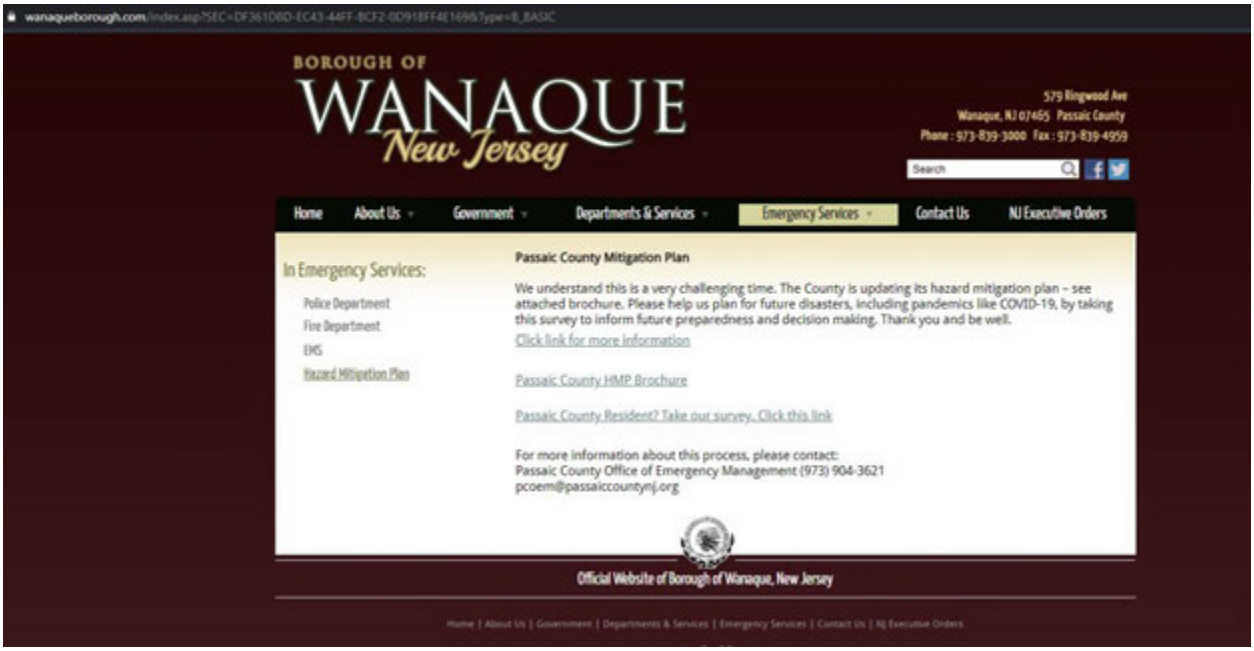

Figure D-17. Township of Wayne Website

Figure D-18. Township of West Milford Website

Figure D-19. Borough of Bloomingdale Facebook Survey

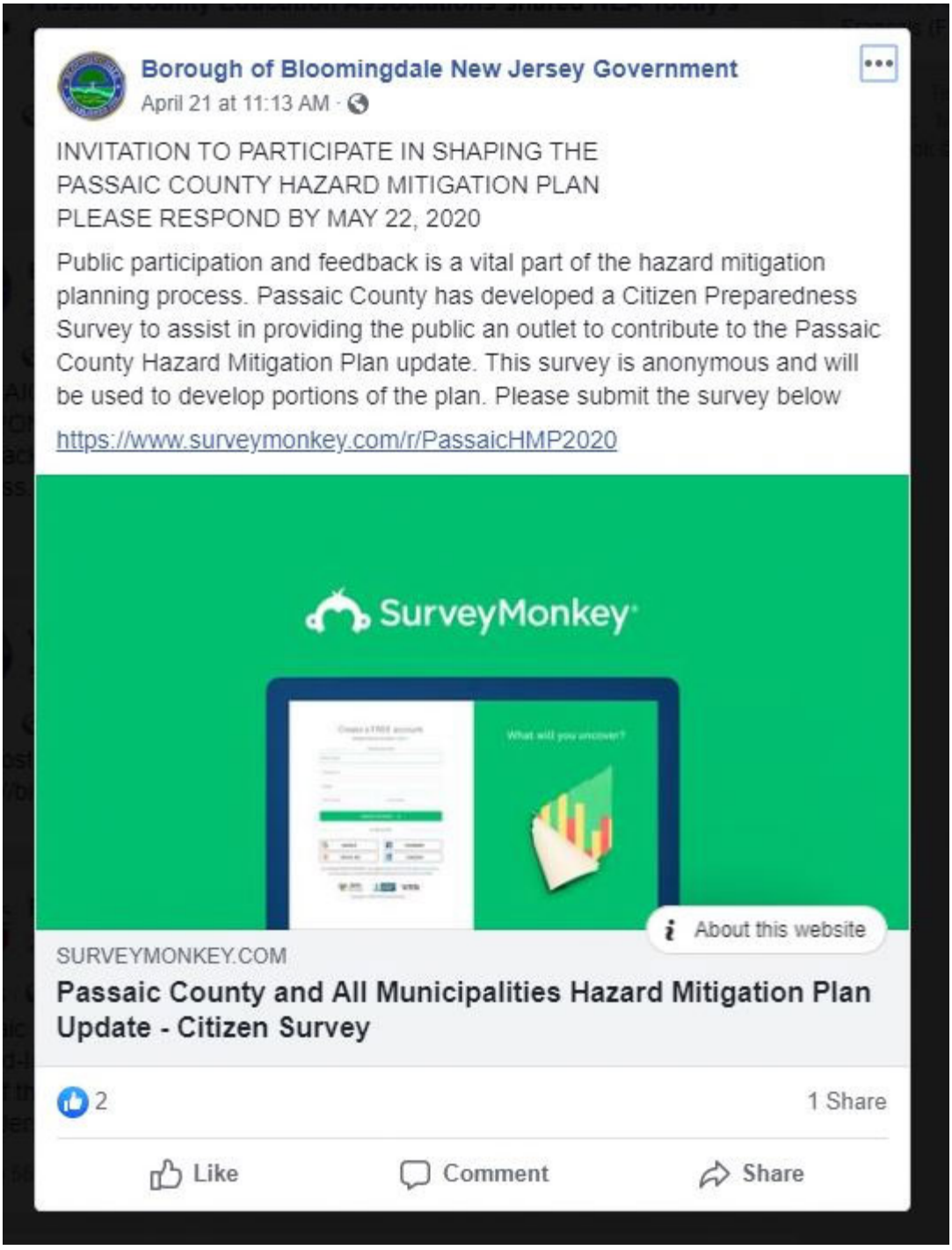

Figure D-20. Borough of Pompton Lakes Survey

Figure D-21. Passaic County Facebook English Post

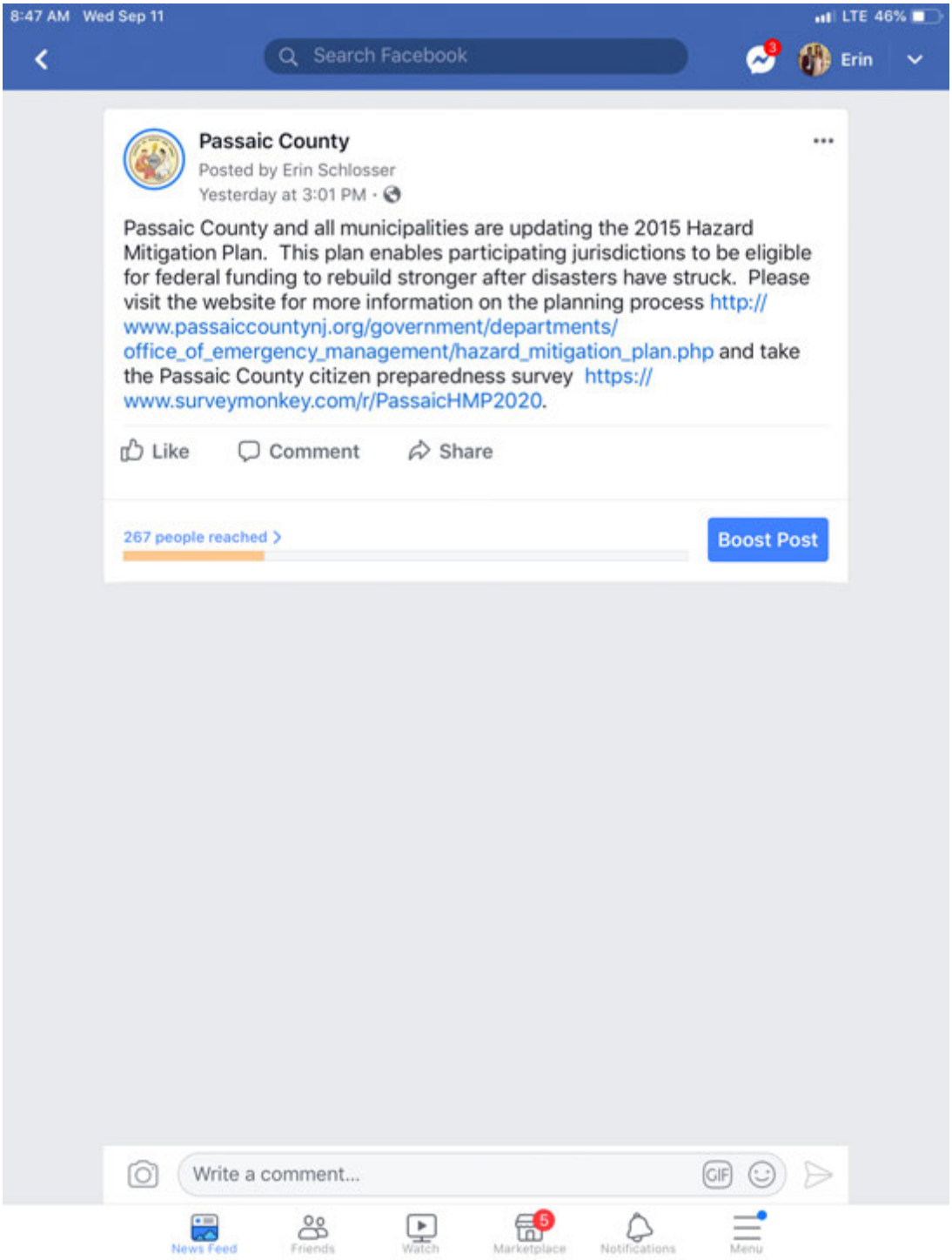

Figure D-22. Passaic County Facebook Spanish Post

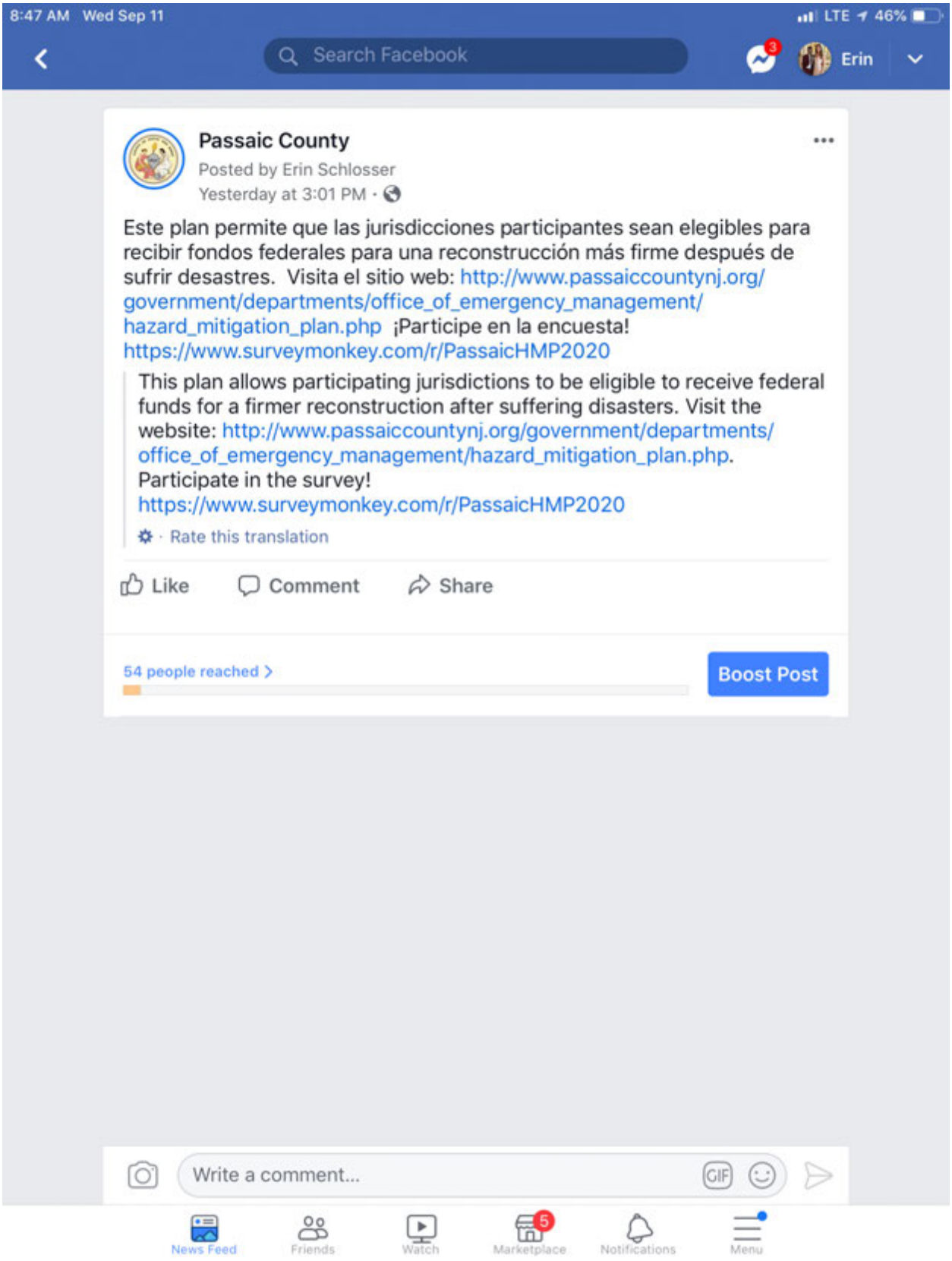

Figure D-23. Passaic County English Facebook Post 2

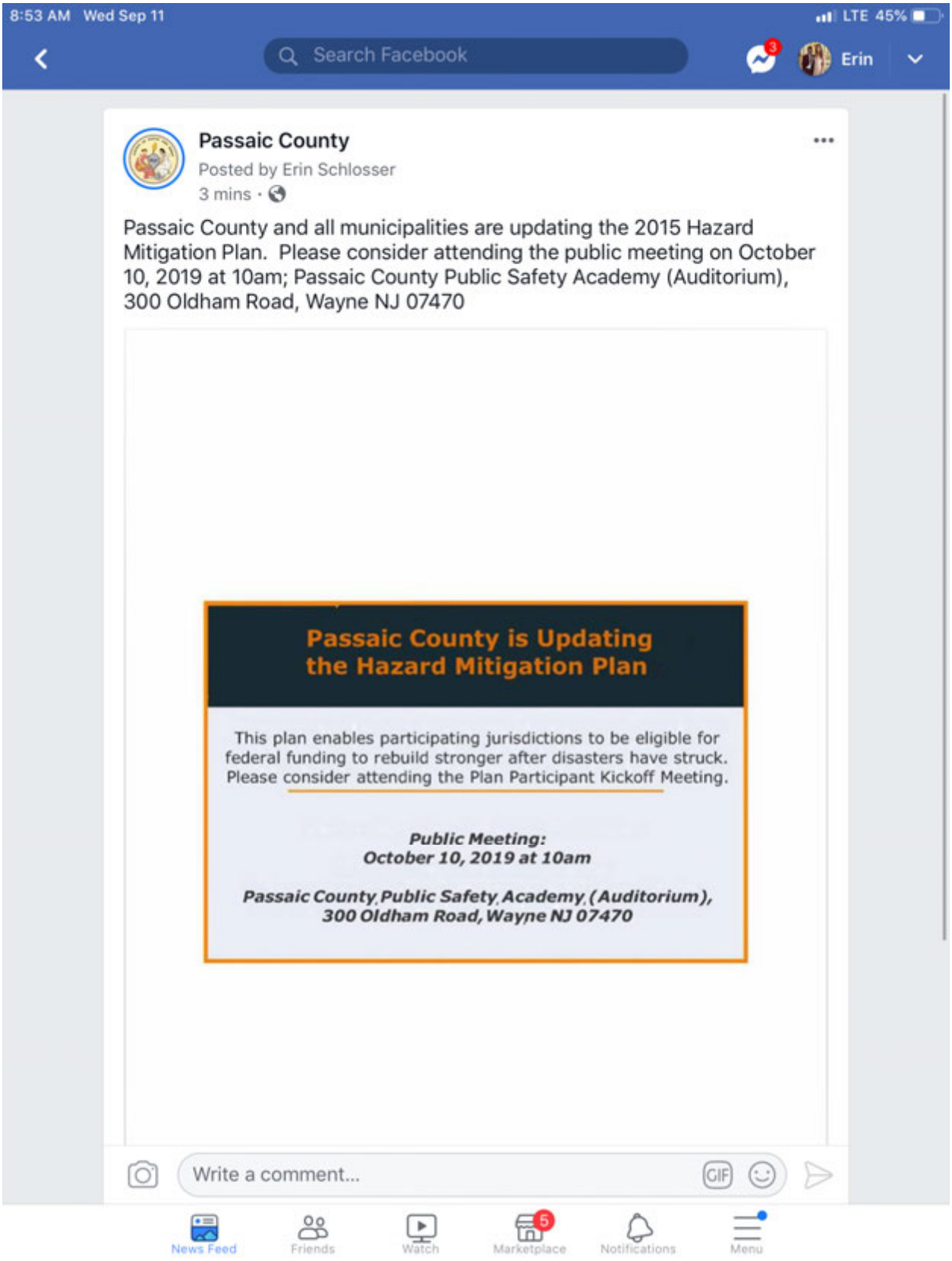

Figure D-24. Passaic County Spanish Facebook Post 2

Figure D-25. Passaic County Public Meeting Update Facebook Post

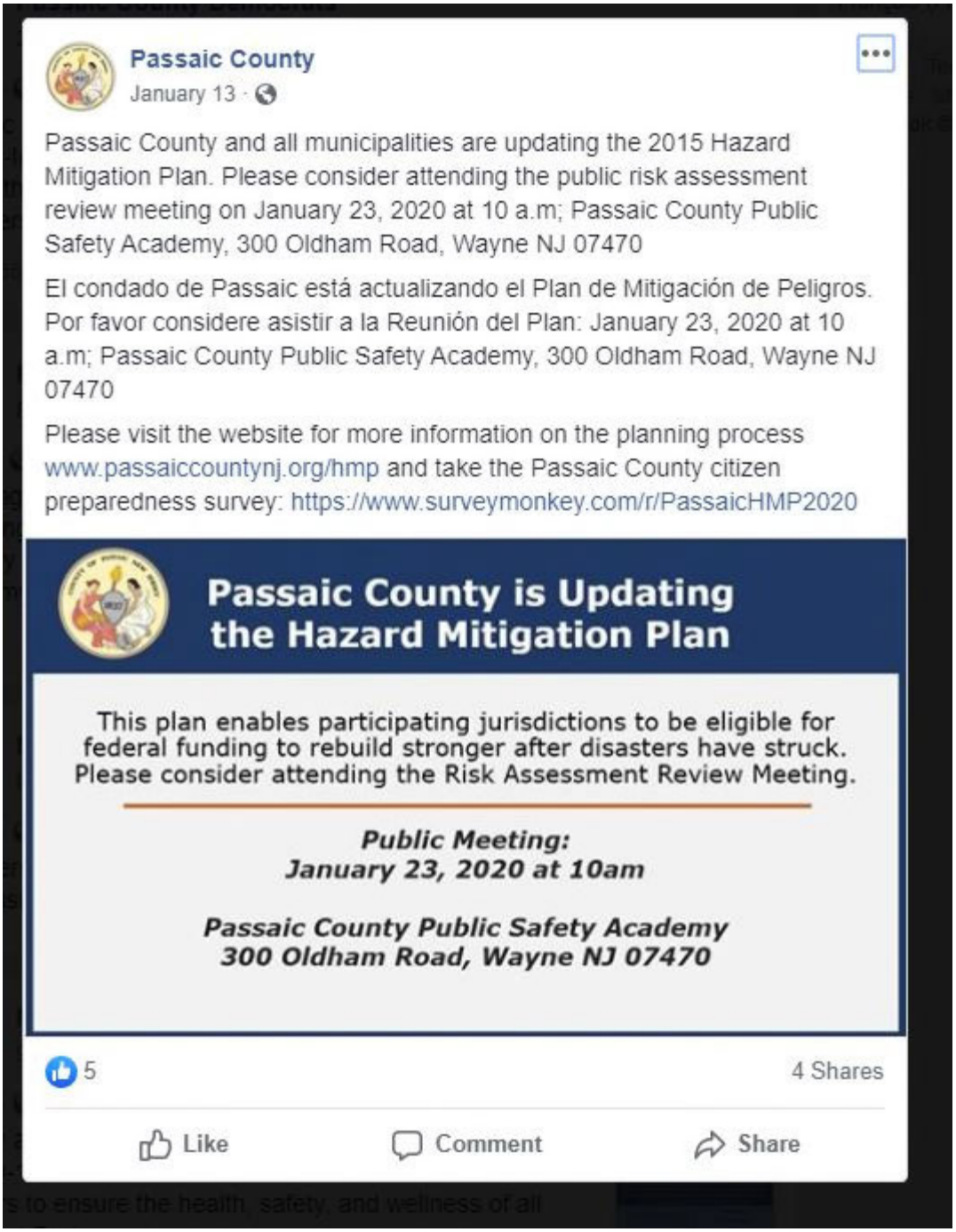

Figure D-26. Pompton Lakes Borough FEMA Flood Meeting Facebook Post

Figure D-27. Wayne Township Facebook Post

Figure D-28. Passaic County English Facebook Post

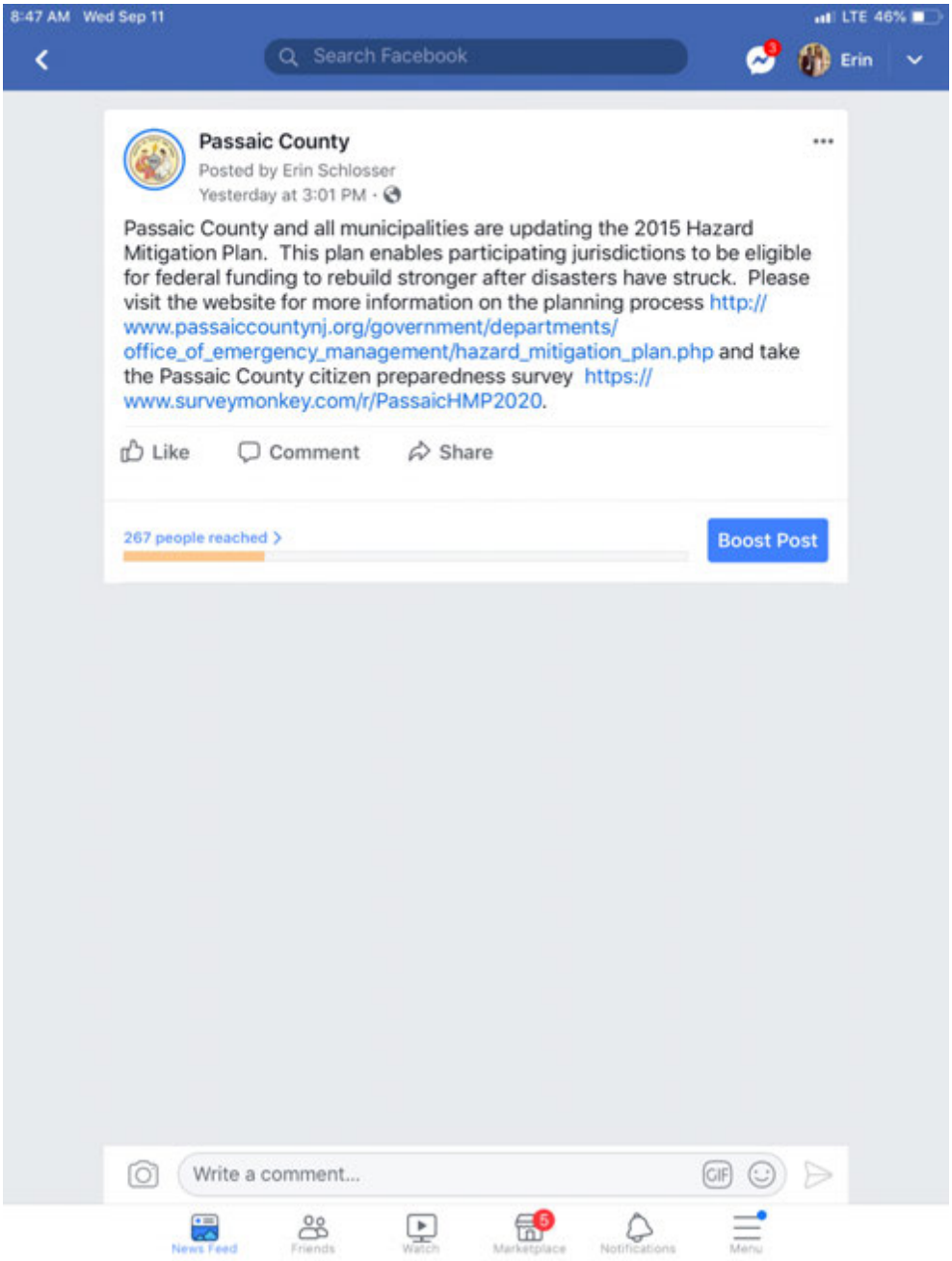

Figure D-29. Passaic County Spanish Facebook Post

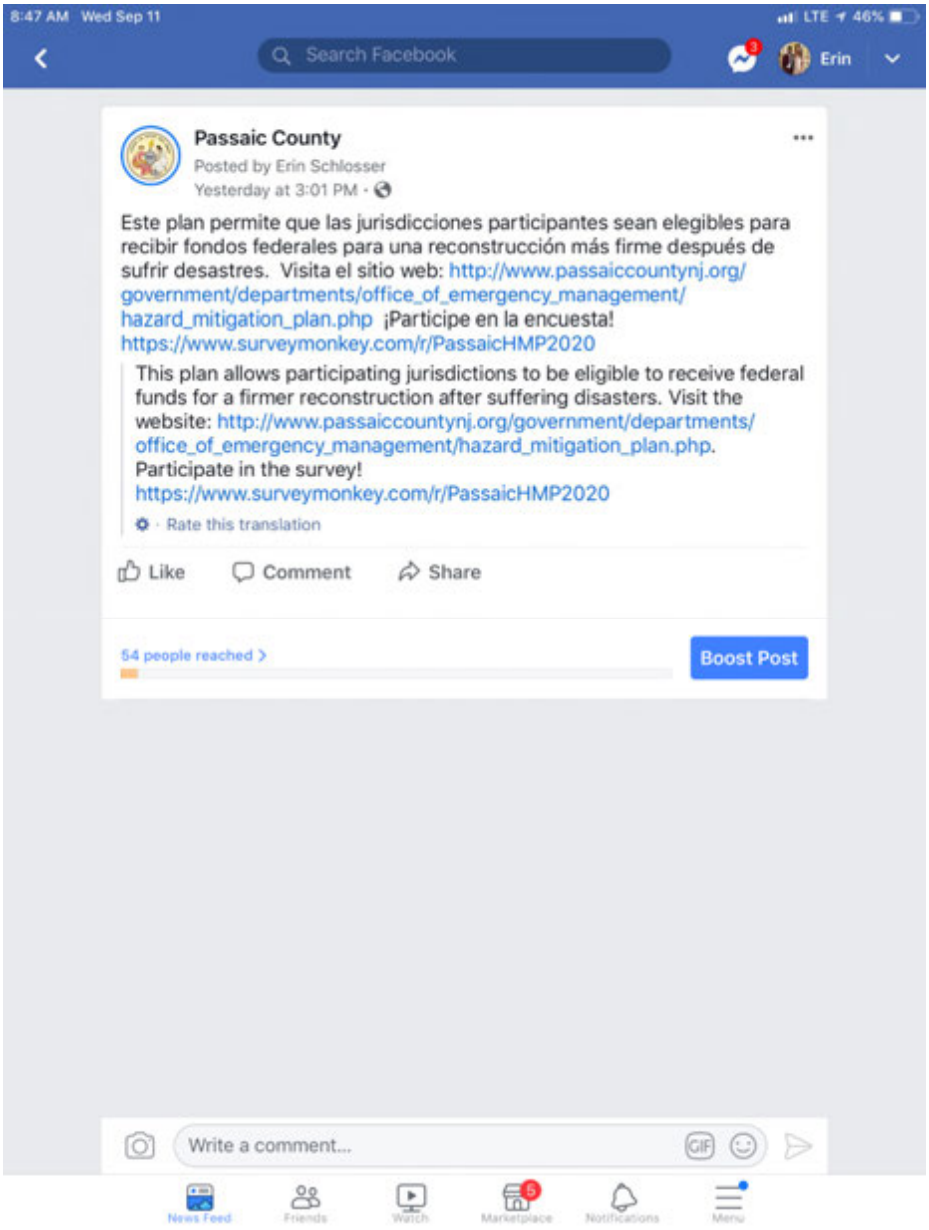

Figure D-30. Passaic County Survey English Twitter Post

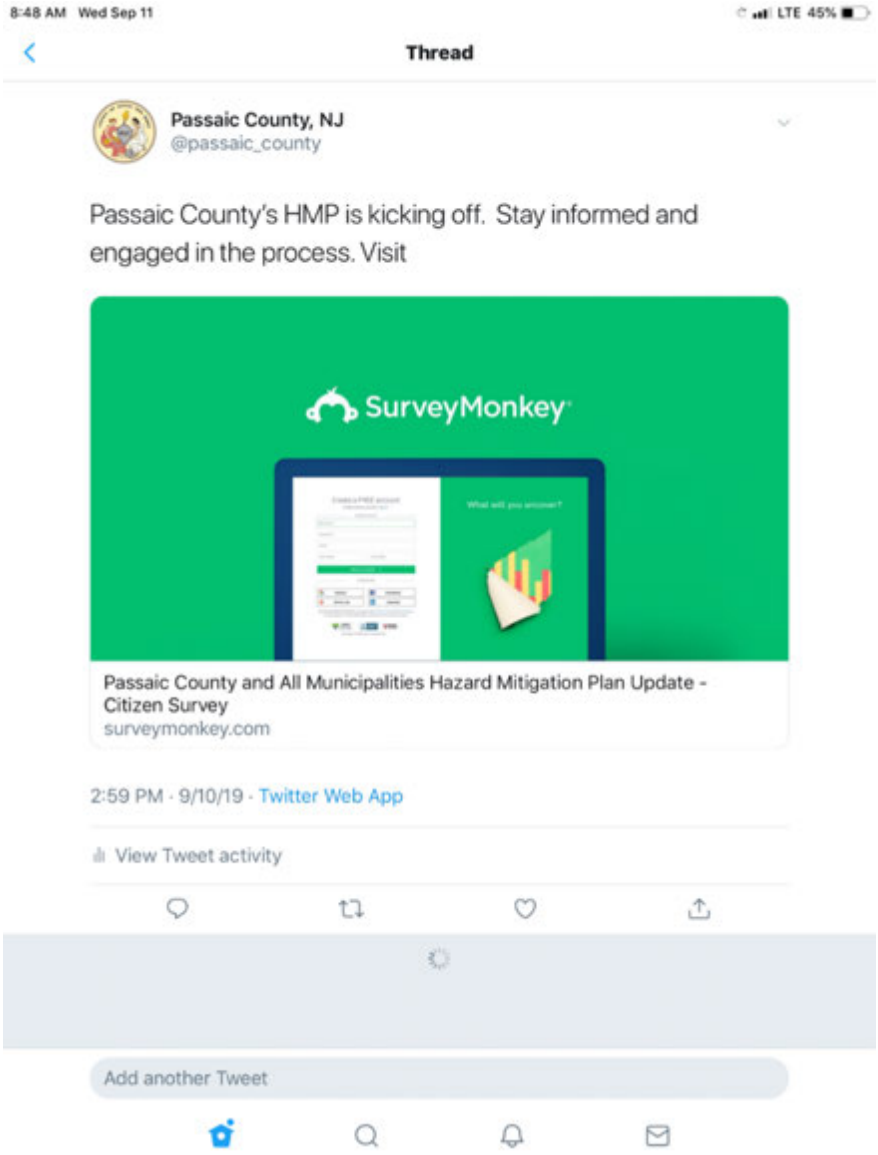

Figure D-31. Passaic County Survey Spanish Twitter Post

Figure D-32. Passaic County Survey English Twitter Post 2

Figure D-33. Passaic County Survey Spanish Twitter Post 2

Figure D-34. Passaic County Public Meeting Twitter Post

Figure D-35. Passaic County Survey Post

D.5 NEIGHBORING COUNTIES AND COMMUNITIES

As discussed in Section 2 (Planning Process), Passaic County has kept surrounding and nearby counties and stakeholders apprised of the project and invited them to participate in the planning process. The following were contacted on July 1, 2020 via formal letter and email from Passaic County OEM to inform them about the draft plan documents and to invite them to provide input. The New Jersey Highlands Council submitted a letter regarding their draft plan review; the letter is enclosed.

- Morris County, New Jersey – Morris County Office of Emergency Management
- Warren County, New Jersey – Warren County Office of Emergency Management
- Sussex County, New Jersey – Sussex County Office of Emergency Management
- Essex County, New Jersey – County Executive and Sheriff/OEM
- Orange County, New York – Orange County Emergency Management
- Rockland County, New York – Rockland County Emergency Services
- New Jersey Highlands Council

County of Passaic

Department of Public Safety

Police Academy
214 Oldham Road
Wayne, NJ 07470
Tel: 973-595-6411
Fax: 973-595-6874

Weights & Measures
151 East 11th Street
Paterson, NJ 07524
Tel: 973-305-5881
Fax: 973-628-1796

Emergency Management
300 Oldham Road
Wayne, NJ 07470
Tel: 973-904-3621
Fax: 973-904-3843

Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Mr. Christopher Kear, Director
Rockland County Emergency Services
35 Fireman's Memorial Drive
Pomona, NY 10907

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Mr. Kear,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

Due to your proximity to Passaic County, the effects of many of these disasters would be similar in your county and your involvement in this process could reap mutual benefits. By participating in the review of this plan, you will be engaging in the regional coordination of disaster mitigation planning, which is one of the intents of the Mitigation Planning Regulations (44 CFR 201).

Presently, our draft plan is now in a public review period prior to submission to FEMA for approval. By means of this letter, Passaic County is seeking your participation in this important planning effort. Specifically, we encourage interested neighboring community representatives to become familiar with this process by reviewing and providing input on the draft and final plan documents by visiting our HMP website:

https://www.passaiccountynj.org/government/departments/office_of_emergency_management/draft_hmp.php

Any questions or comments regarding the plan can be made directly to our Office of Emergency Management at: 973-904-3621 and pcoem@passaiccountynj.org.

Sincerely,

Robert A. Lyons, Coordinator
Passaic County Office of Emergency Management

County of Passaic

Department of Public Safety

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Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Mr. Alan Mack, Deputy Commissioner
Orange County Emergency Management
22 Wells Farm Road
Goshen, NY 10924

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Mr. Mack,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Passaic County Office of Emergency Management

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Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Sheriff Armando Fontoura, Coordinator
Essex County OEM
560 Northfield Avenue
West Orange, NJ 07052

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Sheriff Fontoura,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Robert A. Lyons, Coordinator
Passaic County Office of Emergency Management

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Fax: 973-904-3843

Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Sheriff Michael Strada, Coordinator
Sussex County OEM
135 Morris Turnpike
Newton, NJ 07860

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Sheriff Strada,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Sincerely,

Robert A. Lyons, Coordinator
Passaic County Office of Emergency Management

County of Passaic

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Fax: 973-904-3843

Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Mr. Frank Wheatley, Coordinator
Warren County OEM
1024 Route 57
Washington, NJ 07882

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Mr. Wheatley,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Presently, our draft plan is now in a public review period prior to submission to FEMA for approval. By means of this letter, Passaic County is seeking your participation in this important planning effort. Specifically, we encourage interested neighboring community representatives to become familiar with this process by reviewing and providing input on the draft and final plan documents by visiting our HMP website:

https://www.passaiccountynj.org/government/departments/office_of_emergency_management/draft_hmp.php

Any questions or comments regarding the plan can be made directly to our Office of Emergency Management at: 973-904-3621 and pcoem@passaiccountynj.org.

Sincerely,

Robert A Lyons

Robert A. Lyons, Coordinator
Passaic County Office of Emergency Management

County of Passaic

Department of Public Safety

Police Academy
214 Oldham Road
Wayne, NJ 07470
Tel: 973-595-6411
Fax: 973-595-6874

Weights & Measures
151 East 11th Street
Paterson, NJ 07524
Tel: 973-305-5881
Fax: 973-628-1796

Emergency Management
300 Oldham Road
Wayne, NJ 07470
Tel: 973-904-3621
Fax: 973-904-3843

Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Mr. Scott DiGiralomo, Coordinator
Morris County OEM
PO Box 900
Morristown, NJ 07963-0900

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Mr. DiGiralomo,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Sincerely,

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Passaic County Office of Emergency Management

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Fax: 973-904-3843

Robert A. Lyons, Director/OEM Coordinator

July 1, 2020

Ms. Maryjude Haddock-Weiler, PP/AICP
New Jersey Highlands Council
100 North Road (Route 513)
Chester, NJ 07930-2322'

Re: Passaic County and All Municipalities Hazards Mitigation Plan – 2020 Update

Dear Ms. Weiler,

Passaic County is updating our Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of this plan is to identify vulnerabilities to a variety of hazards, and to develop plans to help minimize losses if disasters should occur. The intent of the plan is to provide a comprehensive document that considers the wide diversity of communities, businesses, and services that are an integral part of Passaic County and the region as a whole. In addition to its value as a hazard mitigation plan, the development of this document is also required under the DMA 2000 to ensure eligibility for federal mitigation funding.

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Specifically, we encourage interested stakeholders and community representatives to become familiar with this process by reviewing and providing input on the draft and final plan documents by visiting our HMP website at:

https://www.passaiccountynj.org/government/departments/office_of_emergency_management/draft_hmp.php

Any questions or comments regarding the plan can be made directly to our Office of Emergency Management at: 973-904-3621 and pcoem@passaiccountynj.org.

Sincerely,

Robert A Lyons

Robert A. Lyons, Coordinator
Passaic County Office of Emergency Management

State of New Jersey

Highlands Water Protection and Planning Council
100 North Road (Route 513)
Chester, New Jersey 07930-2322
(908) 879-6737
(908) 879-4205 (fax)
www.nj.gov/njhighlands

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CARL J. RICHKO
Chairperson

LISA J. PLEVIN
Executive Director

August 3, 2020

VIA EMAIL ONLY:
Robert A. Lyons
OEM Coordinator
300 Oldham Road
Wayne, NJ 07470

Re: Passaic County Draft Hazard Mitigation Plan

Dear Mr. Lyons,

On behalf of the Highlands Water Protection and Planning Council (Highlands Council), thank you for the opportunity to review and provide comment on Passaic County's Draft Hazard Mitigation Plan. I am very pleased to advise you that we found it very well done. The Plan is comprehensive, well thought out, and strongly supported by the participation of all of the municipalities in the County. It incorporates many of the issues of concern to the Highlands Council, evaluates the risks appropriately, and provides a variety of mitigation strategies and efforts that are either underway already, or planned for the future – by both the County and its municipalities.

We were pleased, in particular, to see the extent of attention given to potential flooding issues and the need to identify stormwater management issues and incorporate green infrastructure, including green streets. We share the deep concern as to climate resiliency needs in anticipation of more severe storms, droughts, higher temperatures, increased chance of wildfire, pestilence, disease, and invasive plants and insects. The Highlands Council has begun its own work to examine how best to incorporate resiliency planning into every facet of its work too. Highlands resources could serve as buffer to some of the worst potential effects of climate change, yet could themselves be at serious risk of loss or damage in the years ahead.

We offer just two minor notes for review, and possible correction in the document, where narrative and associated figures do not appear consistent (please see attachment).

We look forward to seeing the Hazard Mitigation Plan adopted and to the continued efforts of all involved as the current 5-year planning cycle unfolds. Please accept our thanks which we extend to your team and all who participated in this important endeavor. Congratulations on a job well done!

Sincerely,

Lisa J. Plevin
Executive Director

Enc.

Notes

1. **Page 3-16:** Table 3-4 data as to population change is for 1900-2017, but table title says "1900-2012" while text says it's for "1900-2010." Source needs update also. Says "Census Data, 2014."

2. **Page 4.3.13-2:** Figure 4.3.13-1 and Figure ~~4.13-2~~ 4.3.13-2 illustrate the wildfire fuel hazard and wildfire risk for Passaic County. Generally, wildfires in Passaic County are more likely to occur in the north and northwestern ~~southern~~ portions of the County, as compared to the more urban communities in the south.

Q1 Name of your Business:

Answered: 13 Skipped: 0

Q2 Name of Respondent:

Answered: 11 Skipped: 2

Q3 Contact information (email address or phone number) - optional:

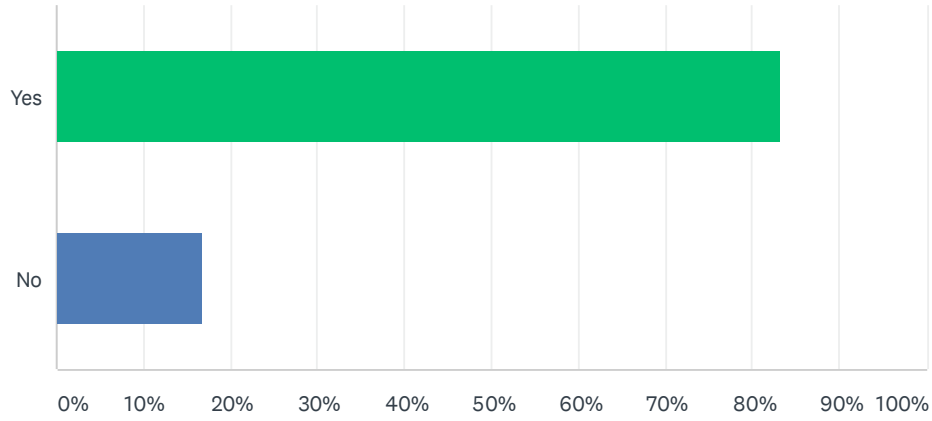
Answered: 12 Skipped: 1

Q4 Please identify the location of your facility(ies) and or primary service area; at minimum include the municipality:

Answered: 12 Skipped: 1

Q5 Has your business been impacted by hazard events (damaged, closed for extended periods, etc.)?

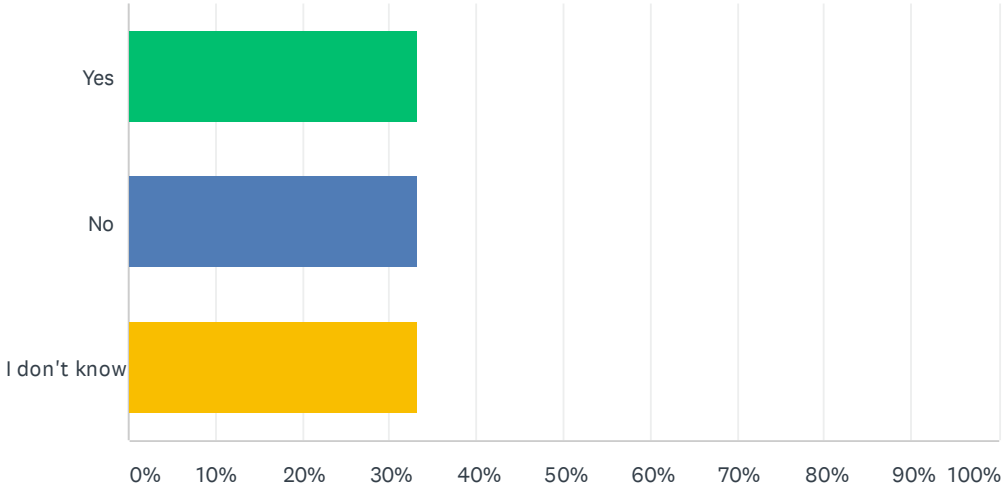
Answered: 12 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	83.33%	10
No	16.67%	2
TOTAL		12

Q6 Do you believe that your facilities are disaster-resistant, or capable of withstanding a disaster (e.g. are properly located and constructed, and have back-up power as appropriate)?

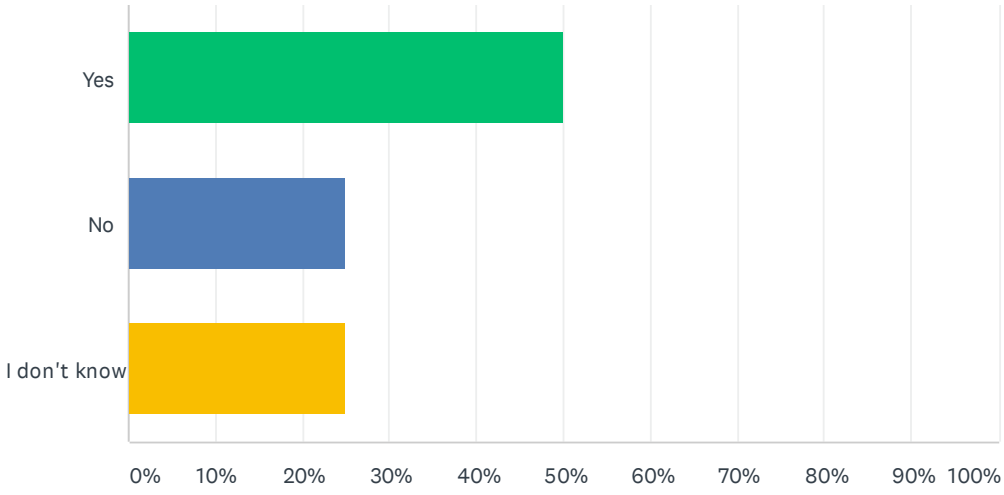
Answered: 12 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	33.33%	4
No	33.33%	4
I don't know	33.33%	4
TOTAL		12

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazard events, and thus provides longterm support for your business and commerical needs?

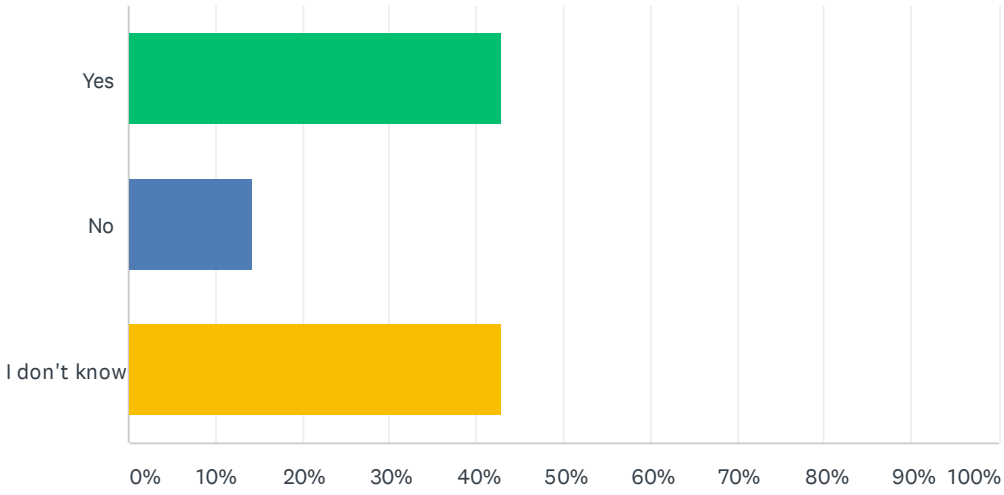
Answered: 12 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	50.00%	6
No	25.00%	3
I don't know	25.00%	3
TOTAL		12

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support your business and commercial needs?

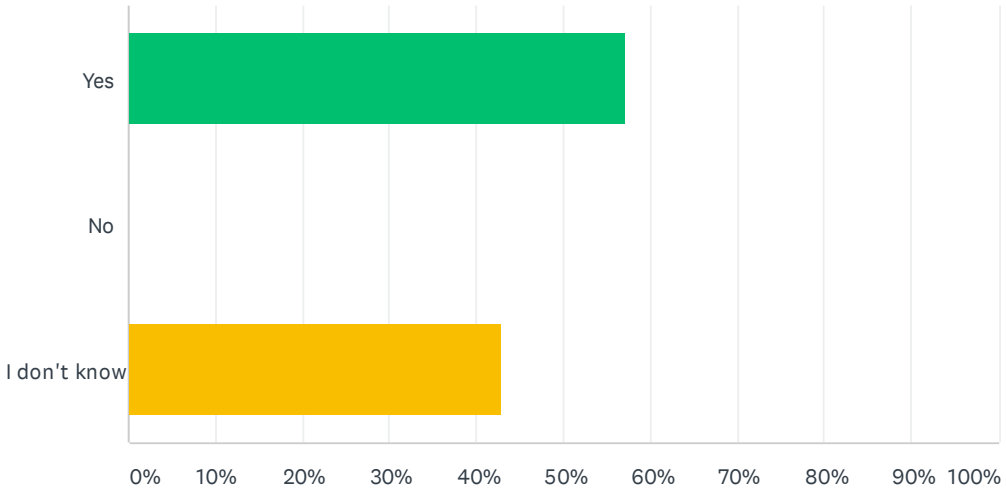
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	42.86%	3
No	14.29%	1
I don't know	42.86%	3
TOTAL		7

Q9 Do you believe that natural hazard risks (e.g. flood zones, wildfire risk zones) are considered when developing or expanding commercial or industrial areas?

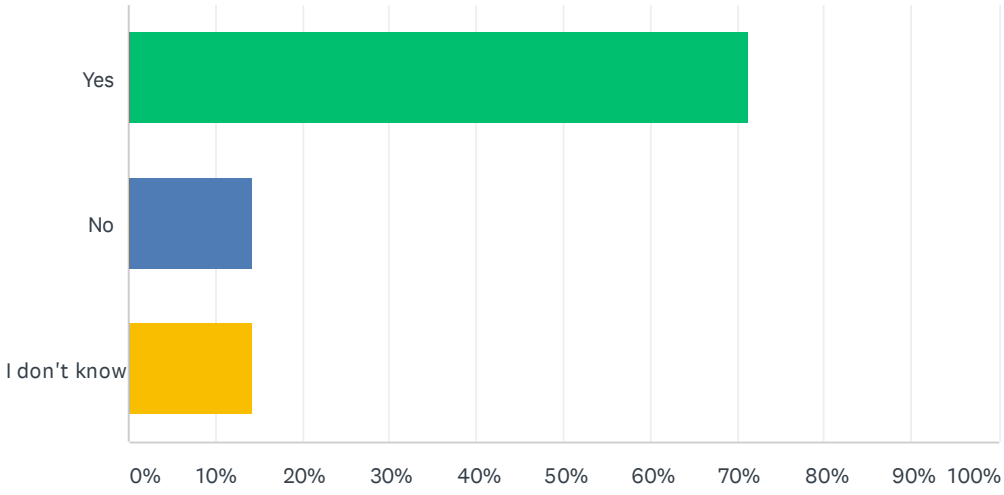
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	57.14%	4
No	0.00%	0
I don't know	42.86%	3
TOTAL		7

Q10 Do you believe that business organizations/associations, chambers of commerce, etc., are a valuable resource in helping business owners protect themselves pre-disaster, and/or recover post-disaster?

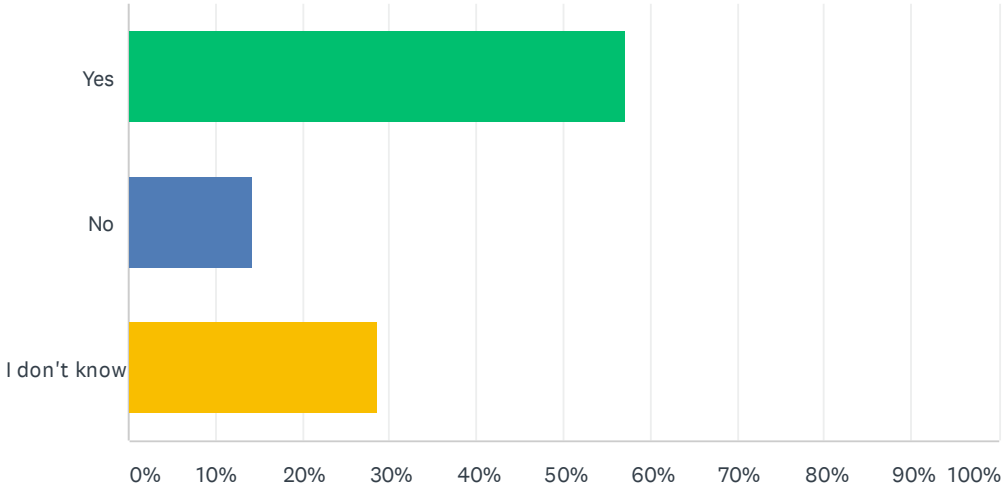
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	71.43%	5
No	14.29%	1
I don't know	14.29%	1
TOTAL		7

Q11 Do you believe that businesses are aware and take appropriate advantage of flood insurance and other risk management resources and programs to help protect them from losses, as well as to support recovery from disasters?

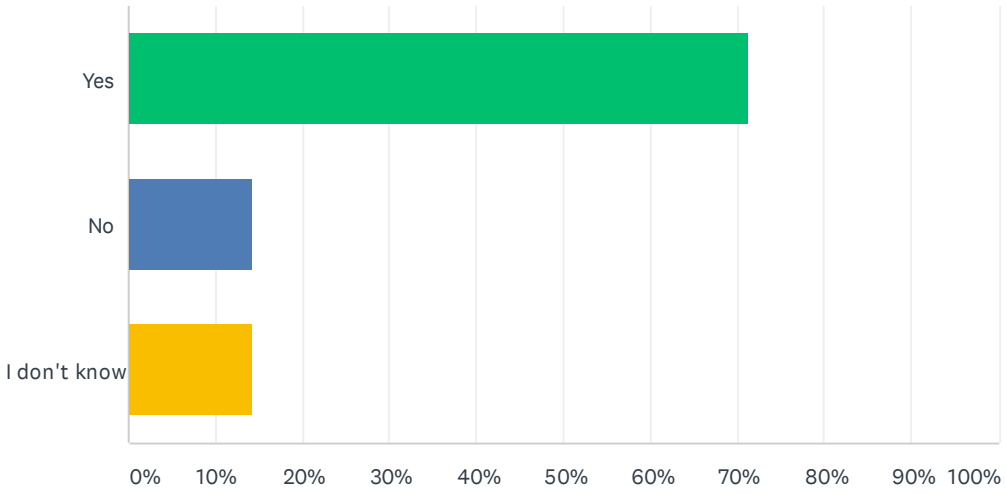
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	57.14%	4
No	14.29%	1
I don't know	28.57%	2
TOTAL		7

Q12 Do you believe that emergency planning, services, and equipment are adequate to manage and respond properly to disasters that may impact your business or commercial interests?

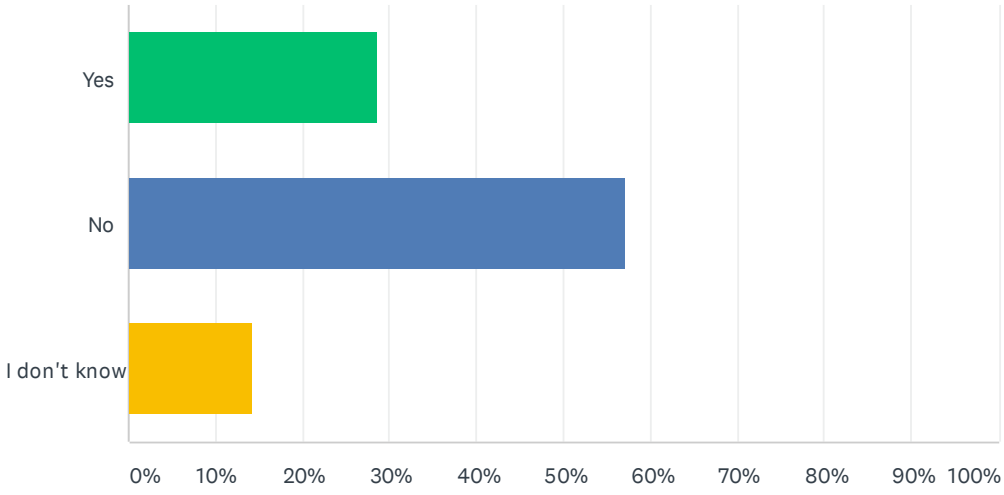
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	71.43%	5
No	14.29%	1
I don't know	14.29%	1
TOTAL		7

Q13 Do you believe that local government understands, supports, and possesses adequate resources for hazard risk reduction efforts in the community?

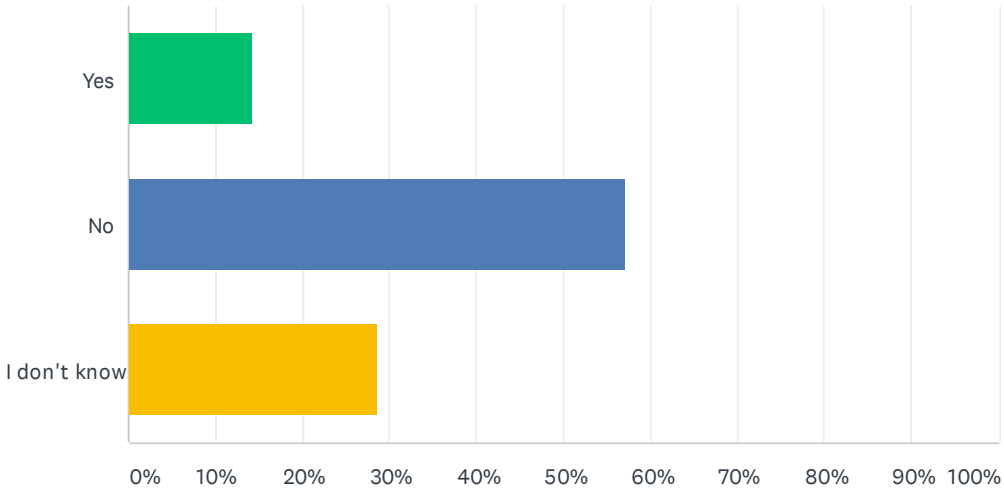
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	28.57%	2
No	57.14%	4
I don't know	14.29%	1
TOTAL		7

Q14 Is your business covered by a Continuity of Operations / Continuity of Government (COOP / COG) plan? COOP / COG plans examine an business's ability to perform minimum essential functions during any situation. COOP activities support the continuance of business functions, while COG activities support the continuance of business governance.

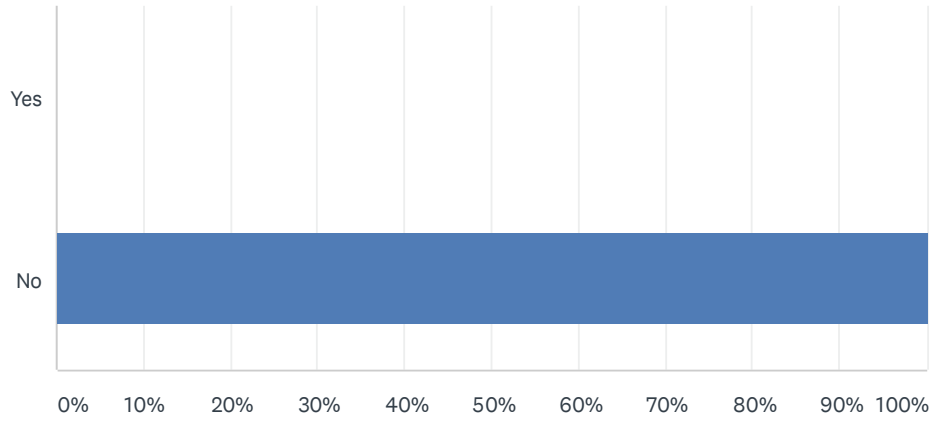
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	14.29%	1
No	57.14%	4
I don't know	28.57%	2
TOTAL		7

Q15 Do you test or drill your COOP?

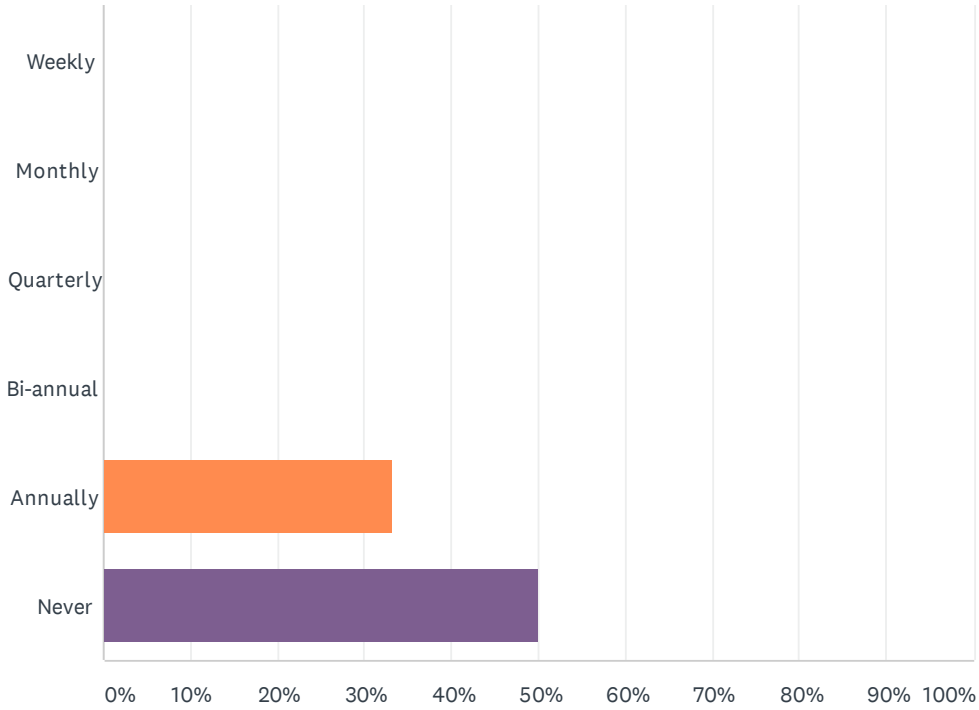
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	100.00%	7
TOTAL		7

Q16 If you have a COOP, how ofter is the plan updated, reviewed and/or revised?

Answered: 6 Skipped: 7



ANSWER CHOICES	RESPONSES	
Weekly	0.00%	0
Monthly	0.00%	0
Quarterly	0.00%	0
Bi-annual	0.00%	0
Annually	33.33%	2
Never	50.00%	3
TOTAL		6

Q17 Based upon past experiences, what do you believe is needed to assist you in continuing your business/organization operations during disasters? Please be as specific as possible.

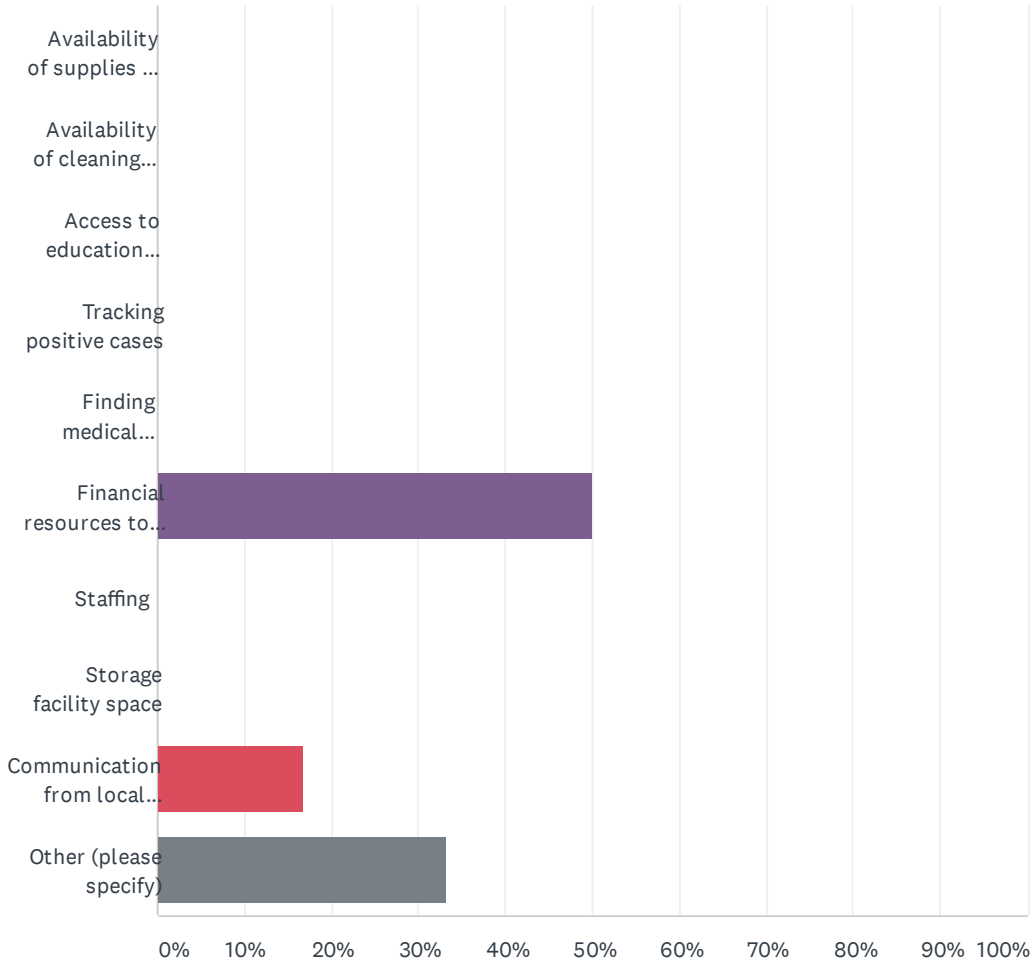
Answered: 5 Skipped: 8

Q18 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 4 Skipped: 9

Q19 Given the current COVID-19 pandemic, please share challenges and obstacles you are facing (you may select more than one):

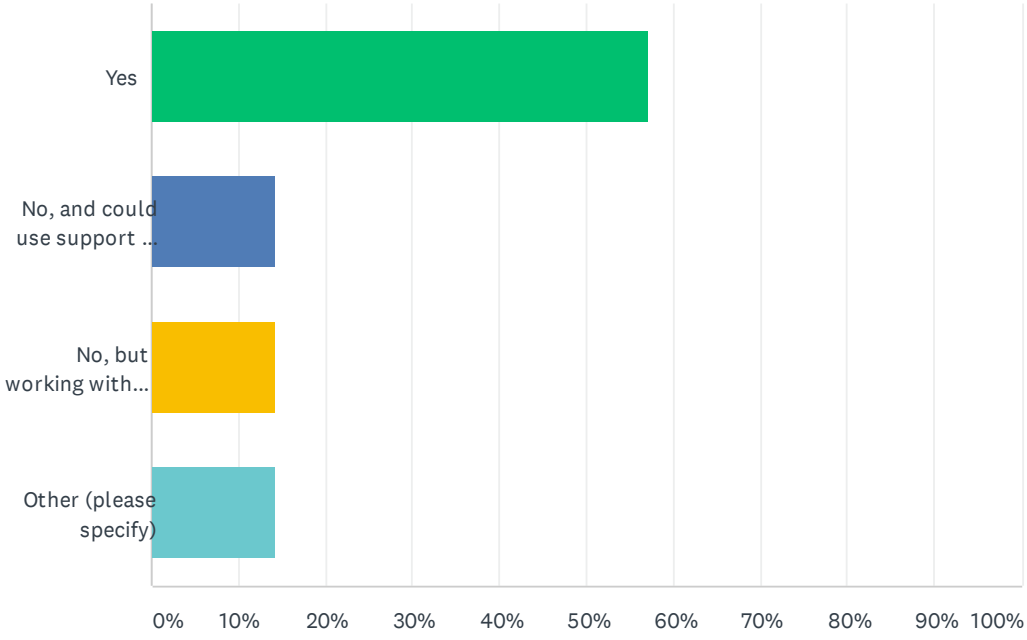
Answered: 6 Skipped: 7



ANSWER CHOICES	RESPONSES	
Availability of supplies and PPE	0.00%	0
Availability of cleaning supplies	0.00%	0
Access to education materials and signage for your establishment	0.00%	0
Tracking positive cases	0.00%	0
Finding medical professionals and medical support	0.00%	0
Financial resources to support your business, daily operations and additional COVID-19 demands	50.00%	3
Staffing	0.00%	0
Storage facility space	0.00%	0
Communication from local officials	16.67%	1
Other (please specify)	33.33%	2
TOTAL		6

Q20 Do you have procedures/protocols in place to return back to standard operations after this pandemic (i.e., cleaning and frequency)?

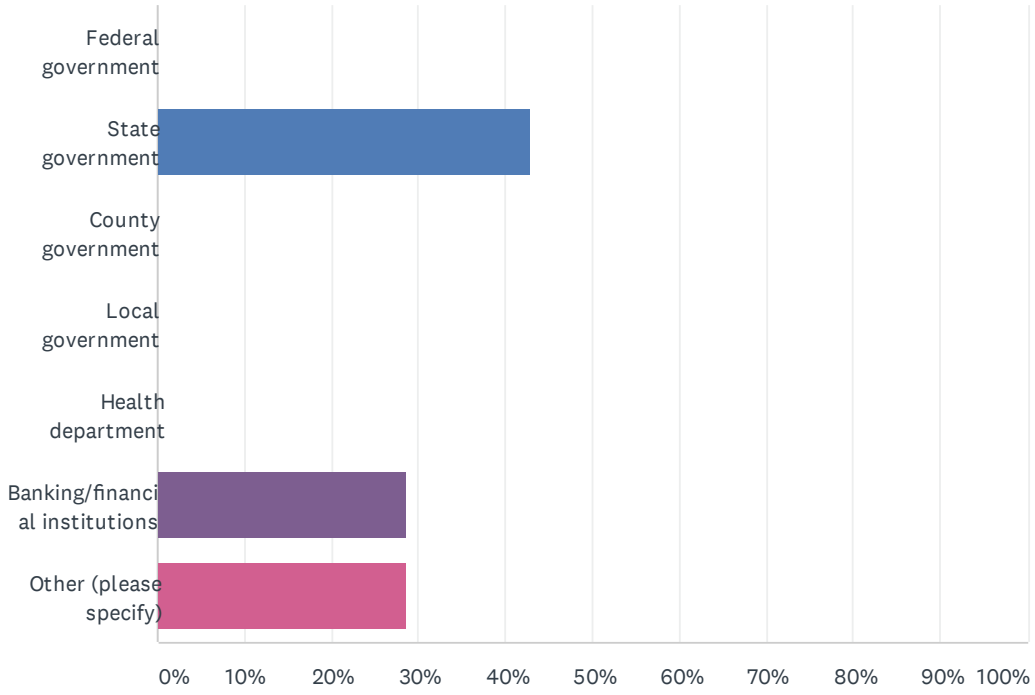
Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	57.14%	4
No, and could use support and guidance on this	14.29%	1
No, but working with a professional to develop	14.29%	1
Other (please specify)	14.29%	1
TOTAL		7

Q21 Where do you need additional guidance and support in responding to and supporting all aspects of the COVID-19 pandemic?

Answered: 7 Skipped: 6



ANSWER CHOICES	RESPONSES	
Federal government	0.00%	0
State government	42.86%	3
County government	0.00%	0
Local government	0.00%	0
Health department	0.00%	0
Banking/financial institutions	28.57%	2
Other (please specify)	28.57%	2
TOTAL		7

Q22 What additional resources do you need to better prepare for the next event?

Answered: 4 Skipped: 9

Q23 Do you have any other comments, questions, or concerns?

Answered: 4 Skipped: 9

Q1 Name of your Police Department, Fire Department or EMS Agency / Facility:

Answered: 31 Skipped: 0

Q2 Name of Respondent:

Answered: 24 Skipped: 7

Q3 Contact information (email address or phone number) - optional:

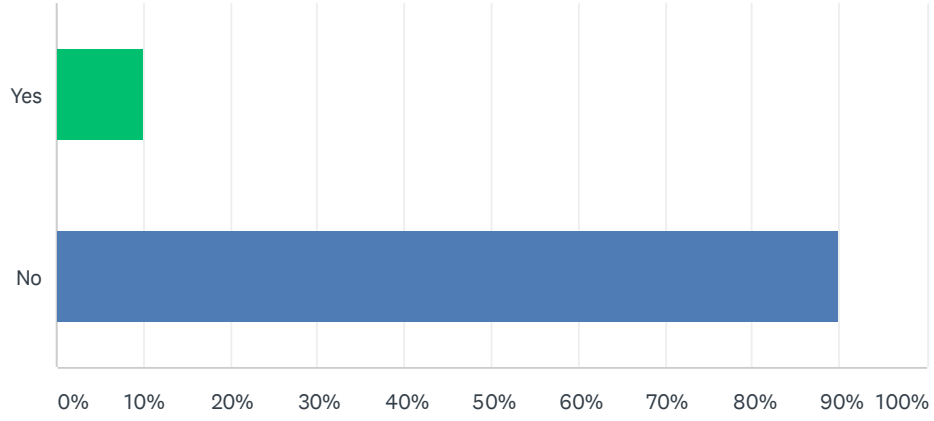
Answered: 20 Skipped: 11

Q4 Please identify the location of your facility(ies) and or primary service area; at minimum include the municipality:

Answered: 29 Skipped: 2

Q5 Has your EMS facility been impacted by hazard events (damaged, closed for extended periods, etc.)?

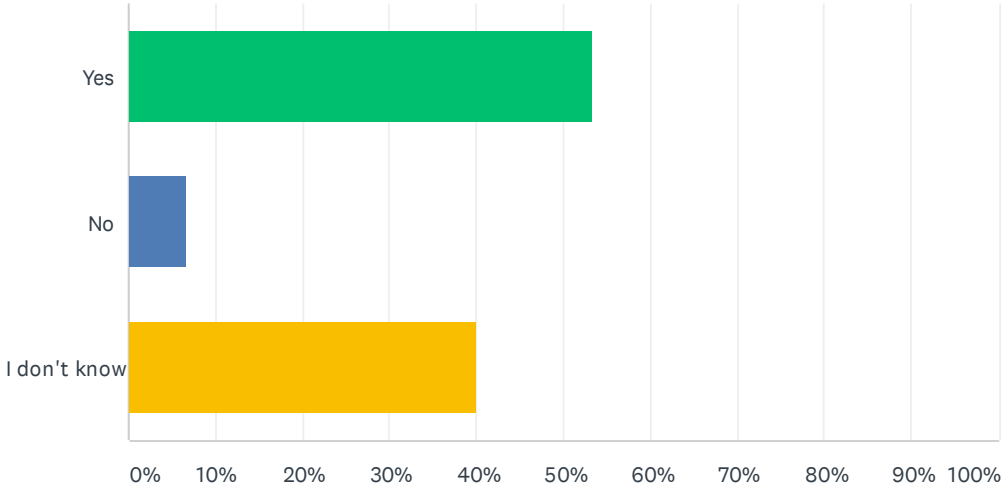
Answered: 30 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	10.00%	3
No	90.00%	27
TOTAL		30

Q6 Do you think that critical and essential facilities (including EMS facilities, hospitals and medical centers) are disaster-resistant (e.g. are properly located and constructed, and have back-up power as appropriate)?

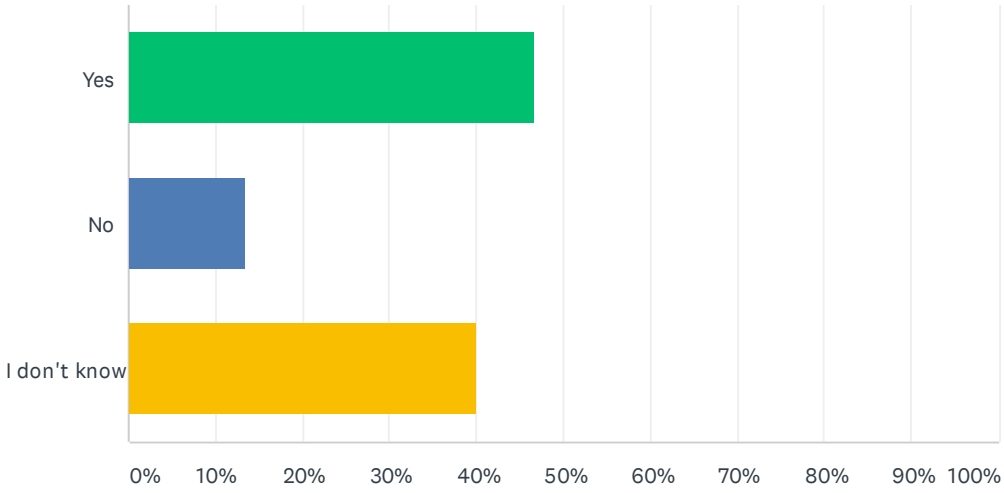
Answered: 30 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	53.33%	16
No	6.67%	2
I don't know	40.00%	12
TOTAL		30

Q7 Do you think that the transportation infrastructure serving your facilities (e.g. roads and bridges) are properly designed to withstand closures and/or damage due to hazards?

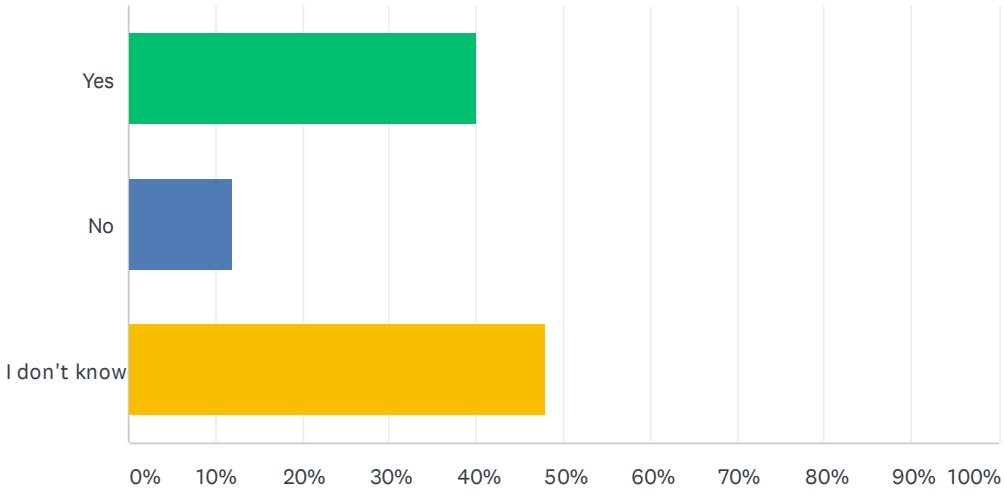
Answered: 30 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	46.67%	14
No	13.33%	4
I don't know	40.00%	12
TOTAL		30

Q8 Do you think that the utility infrastructure (specifically electricity and communications) is sufficiently disaster-resistant to support EMS functions during and after hazard events?

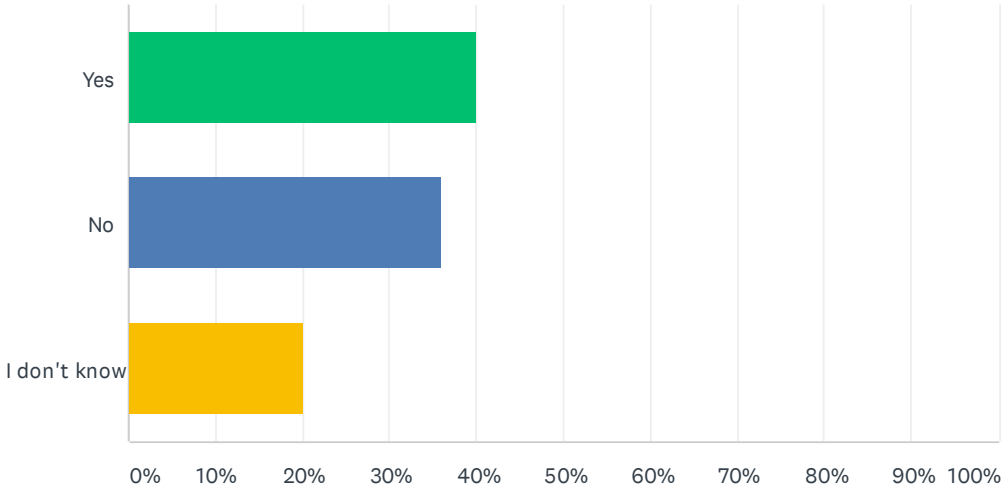
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	40.00%	10
No	12.00%	3
I don't know	48.00%	12
TOTAL		25

Q9 Do you think that local public education and awareness programs are effective at informing the public on what they should do to be prepared for and reduce their personal risk to disasters, so as not to increase the need for EMS during hazard events?

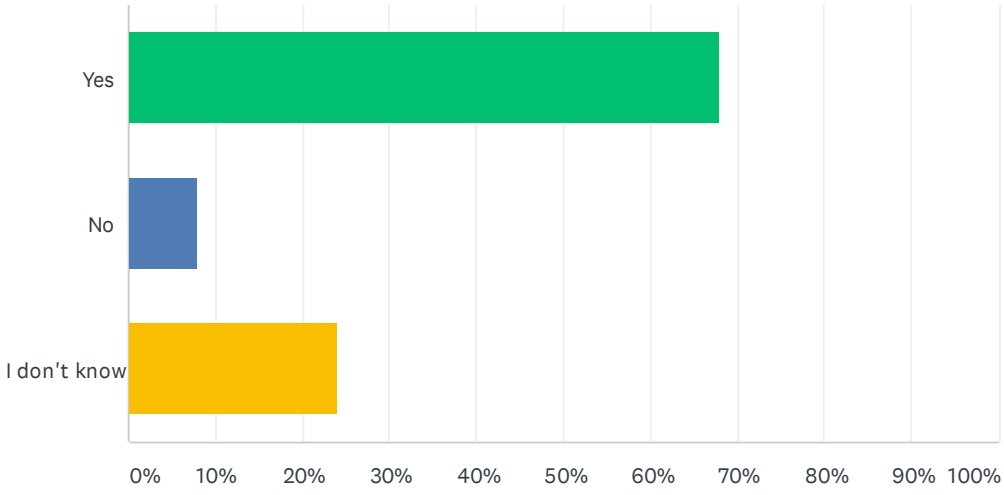
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	40.00%	10
No	36.00%	9
I don't know	20.00%	5
TOTAL		25

Q10 Do you think that announcements of road closures and pending road closures are sufficiently accurate and available to support EMS functions during hazard events?

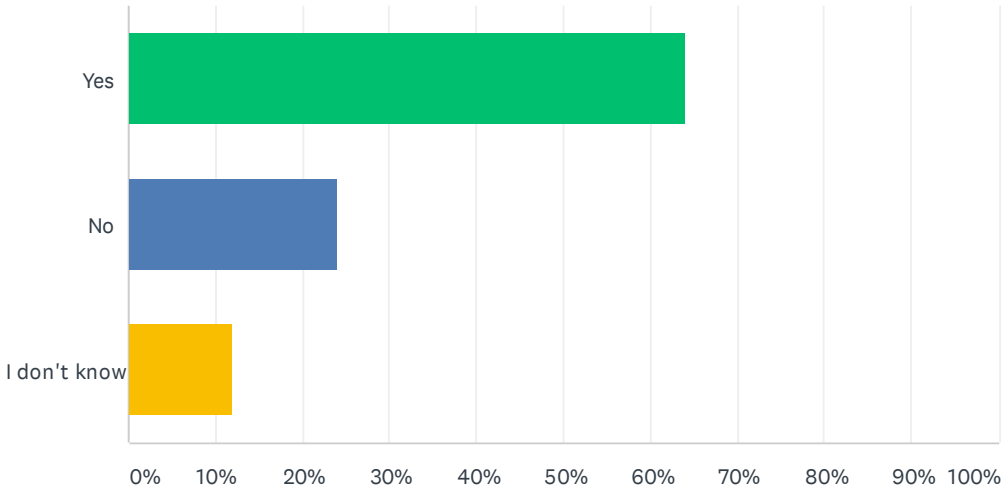
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	68.00%	17
No	8.00%	2
I don't know	24.00%	6
TOTAL		25

Q11 Do you think that the public is aware of, understands, and takes advantage of emergency warning and notification systems and services (reverse 911, audible alerts, cell and text services)?

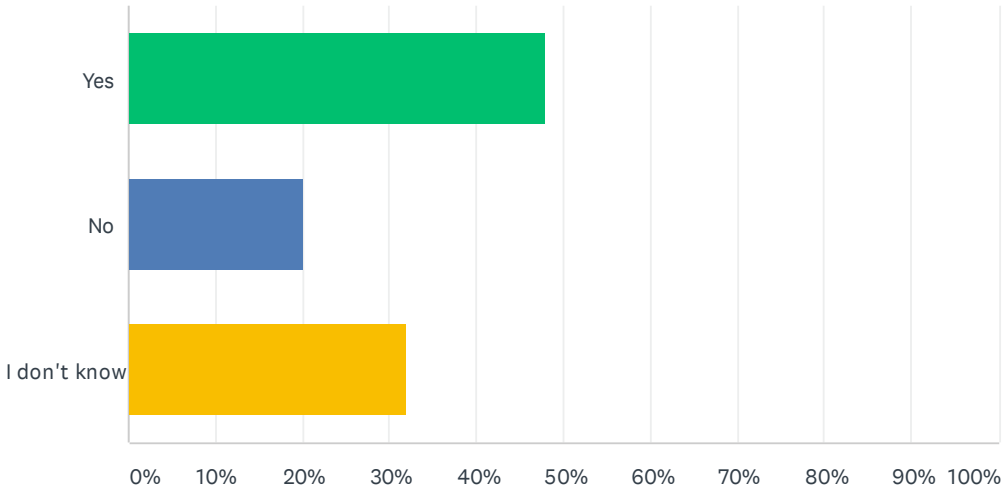
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	64.00%	16
No	24.00%	6
I don't know	12.00%	3
TOTAL		25

Q12 Do you think that your EMS company works to inform your constituents of how they can better manage their risk to hazards?

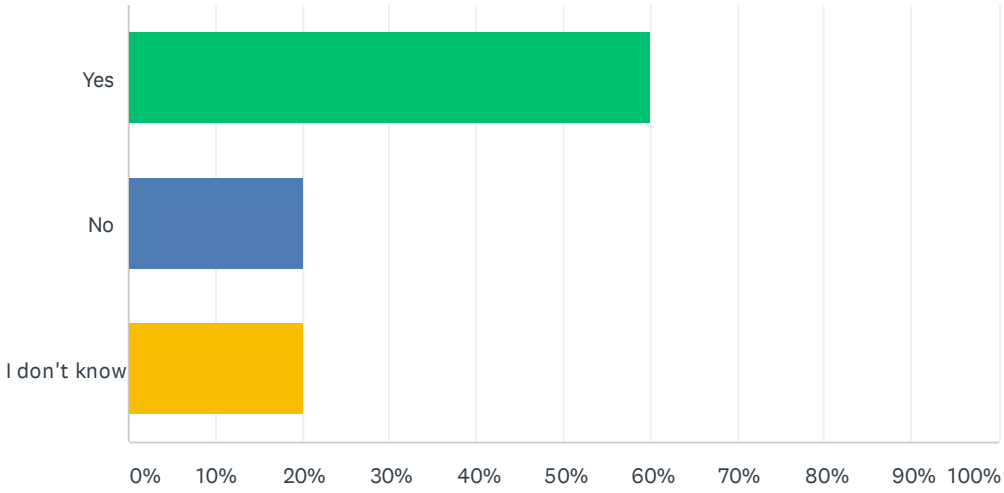
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	48.00%	12
No	20.00%	5
I don't know	32.00%	8
TOTAL		25

Q13 Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to disasters in your community, excluding COVID-19 pandemic?

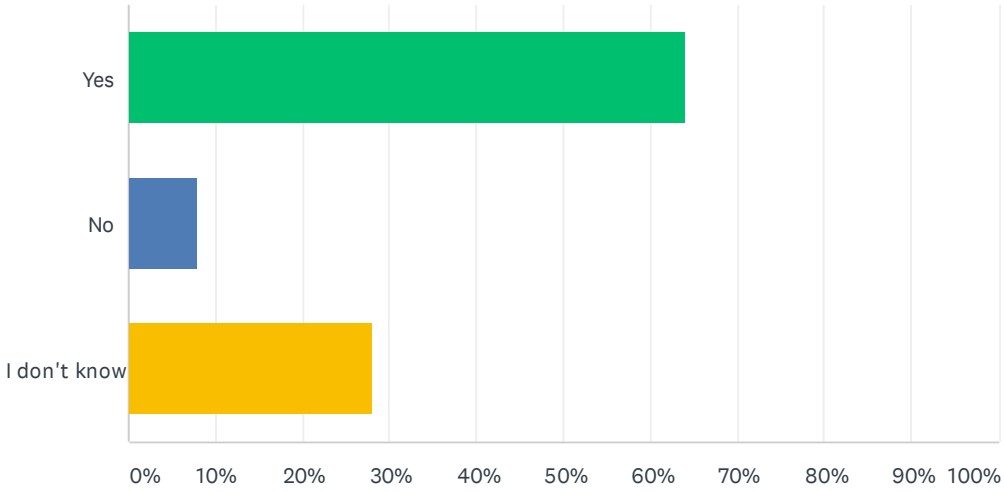
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	60.00%	15
No	20.00%	5
I don't know	20.00%	5
TOTAL		25

Q14 Do you think that local government understands, supports, and possess the resources for hazard risk reduction efforts in the community?

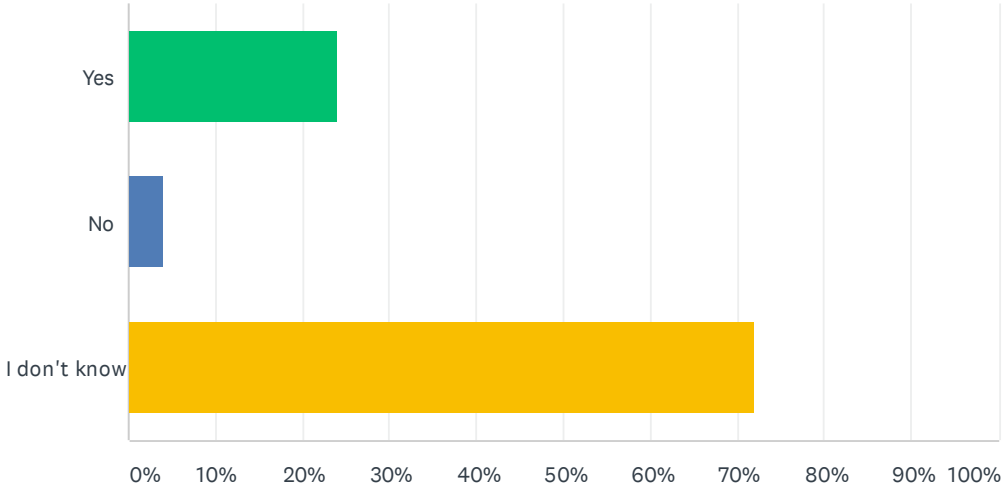
Answered: 25 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	64.00%	16
No	8.00%	2
I don't know	28.00%	7
TOTAL		25

Q15 Is your organization covered by a Continuity of Operations (COOP) plan? COOP plans examine an organization's ability to perform minimum essential functions during any situation, and support the continuance of organization functions?

Answered: 25 Skipped: 6



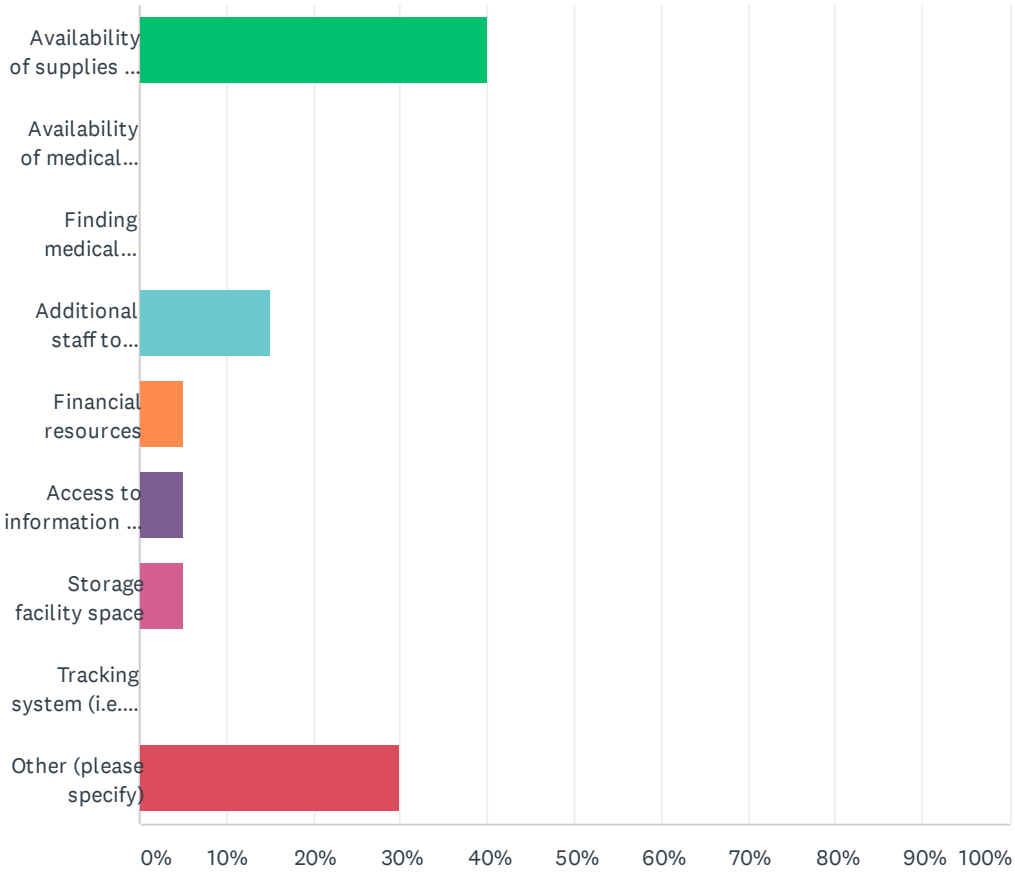
ANSWER CHOICES	RESPONSES	
Yes	24.00%	6
No	4.00%	1
I don't know	72.00%	18
TOTAL		25

Q16 Can you identify projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?

Answered: 7 Skipped: 24

Q17 Given the current COVID-19 pandemic, please share challenges and obstacles you are facing (you may select more than one):

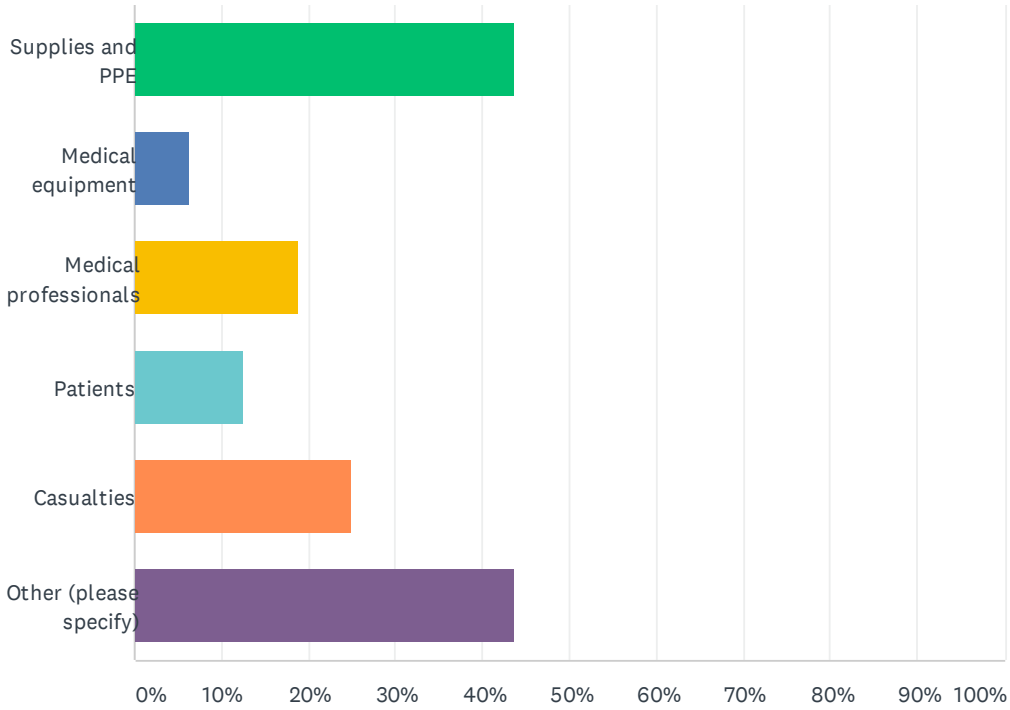
Answered: 20 Skipped: 11



ANSWER CHOICES	RESPONSES	
Availability of supplies and PPE	40.00%	8
Availability of medical equipment	0.00%	0
Finding medical professionals	0.00%	0
Additional staff to support	15.00%	3
Financial resources	5.00%	1
Access to information and signage	5.00%	1
Storage facility space	5.00%	1
Tracking system (i.e., track supplies, track patients, track resources)	0.00%	0
Other (please specify)	30.00%	6
TOTAL		20

Q18 Do you have a database or method to track the following?

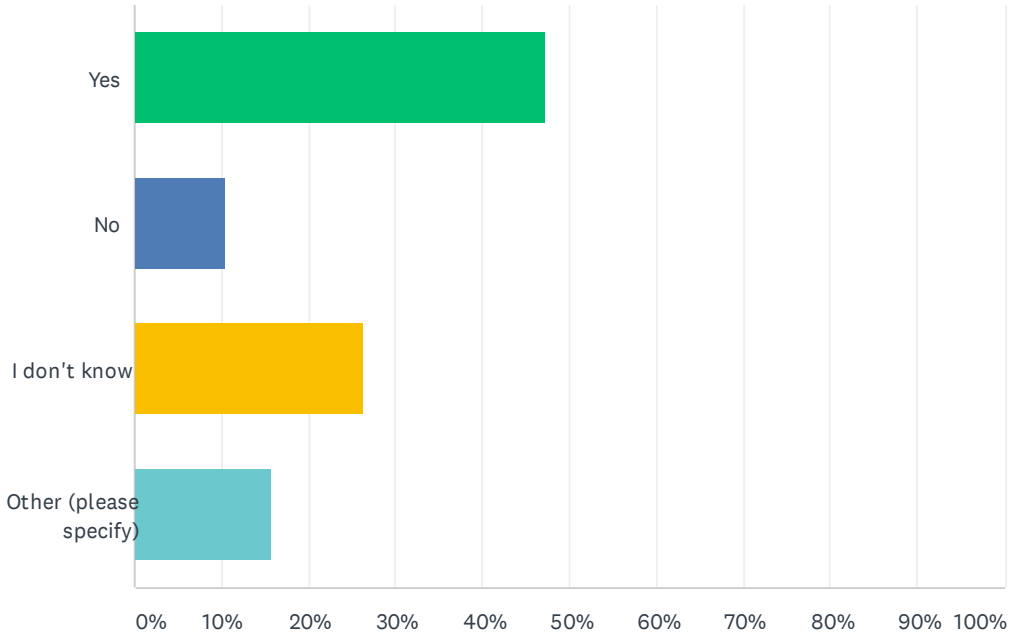
Answered: 16 Skipped: 15



ANSWER CHOICES	RESPONSES	
Supplies and PPE	43.75%	7
Medical equipment	6.25%	1
Medical professionals	18.75%	3
Patients	12.50%	2
Casualties	25.00%	4
Other (please specify)	43.75%	7
Total Respondents: 16		

Q19 Do you have procedures/protocols in place to return back to standard operations after this pandemic (i.e., cleaning and frequency)?

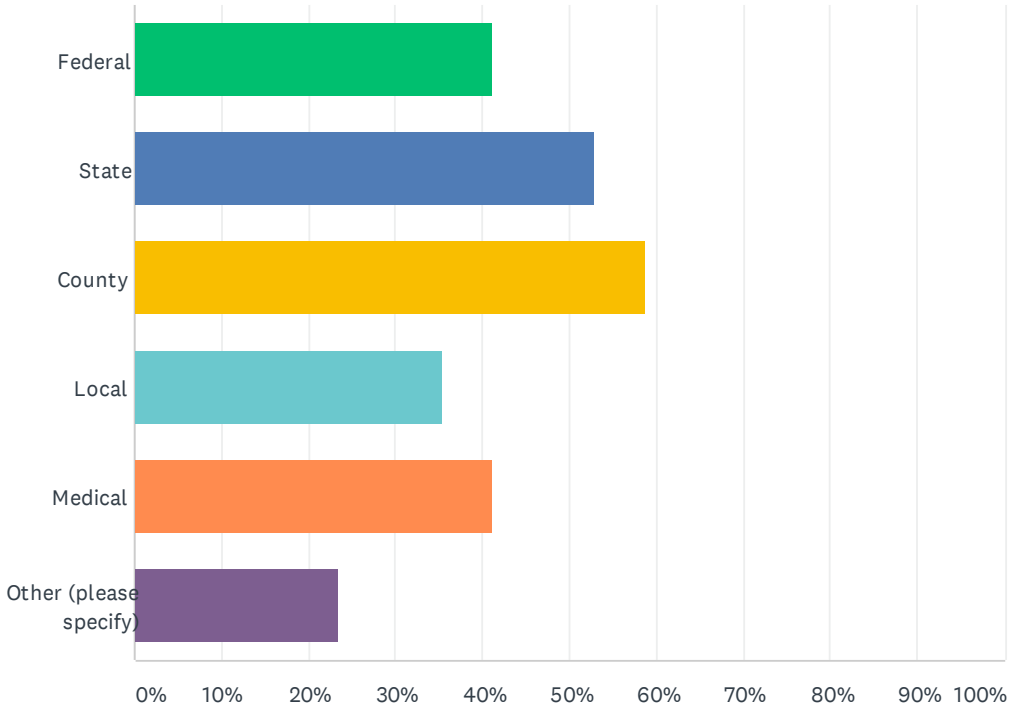
Answered: 19 Skipped: 12



ANSWER CHOICES	RESPONSES	
Yes	47.37%	9
No	10.53%	2
I don't know	26.32%	5
Other (please specify)	15.79%	3
TOTAL		19

Q20 Where do you need additional guidance and support in responding to and supporting all aspects of the COVID-19 pandemic?

Answered: 17 Skipped: 14



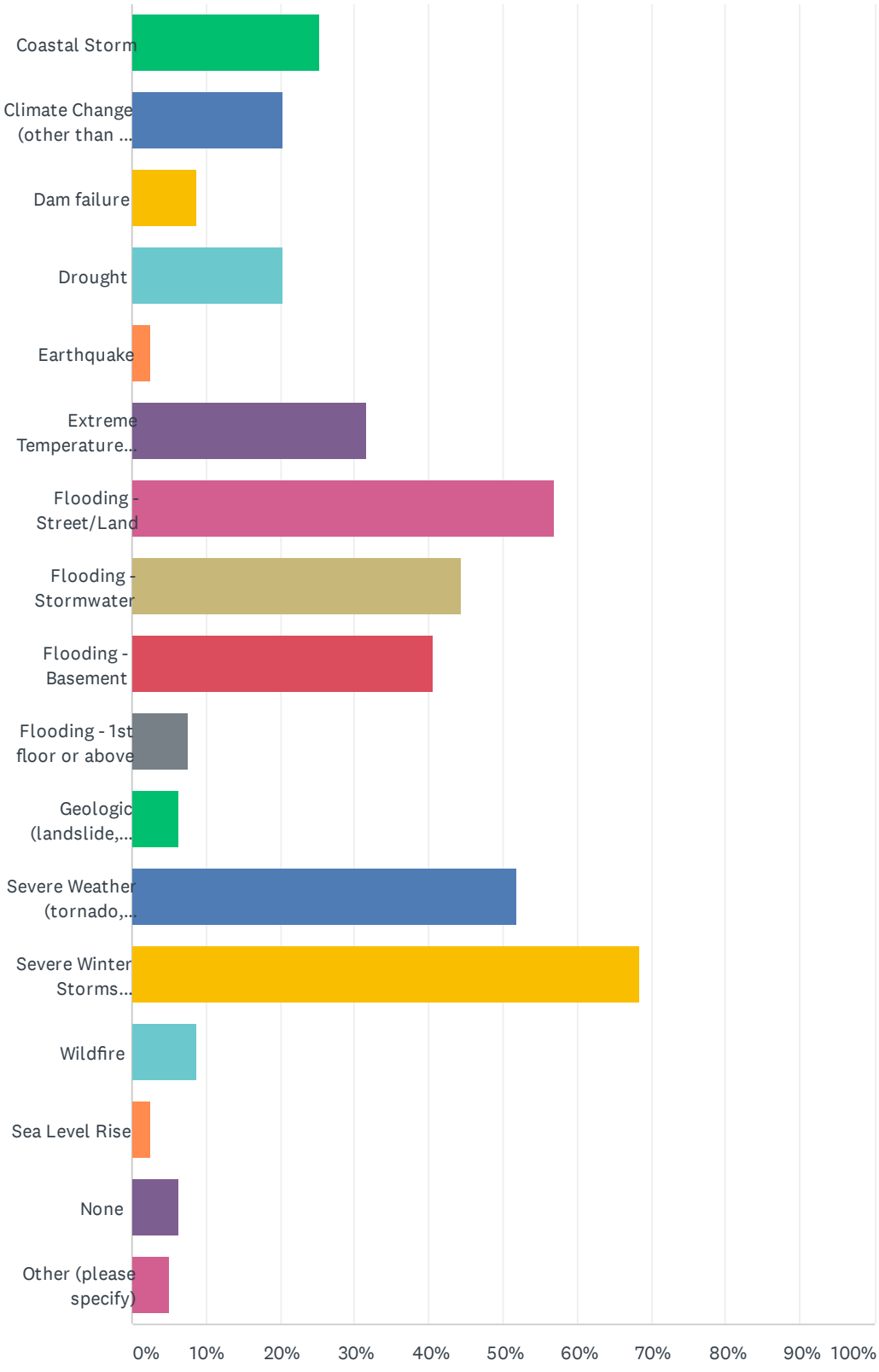
ANSWER CHOICES	RESPONSES	
Federal	41.18%	7
State	52.94%	9
County	58.82%	10
Local	35.29%	6
Medical	41.18%	7
Other (please specify)	23.53%	4
Total Respondents: 17		

Q21 Do you have any other comments, questions, or concerns?

Answered: 7 Skipped: 24

Q1 In the past 10 years, which of the following natural hazard events have you experienced in Passaic County? Check all that apply.

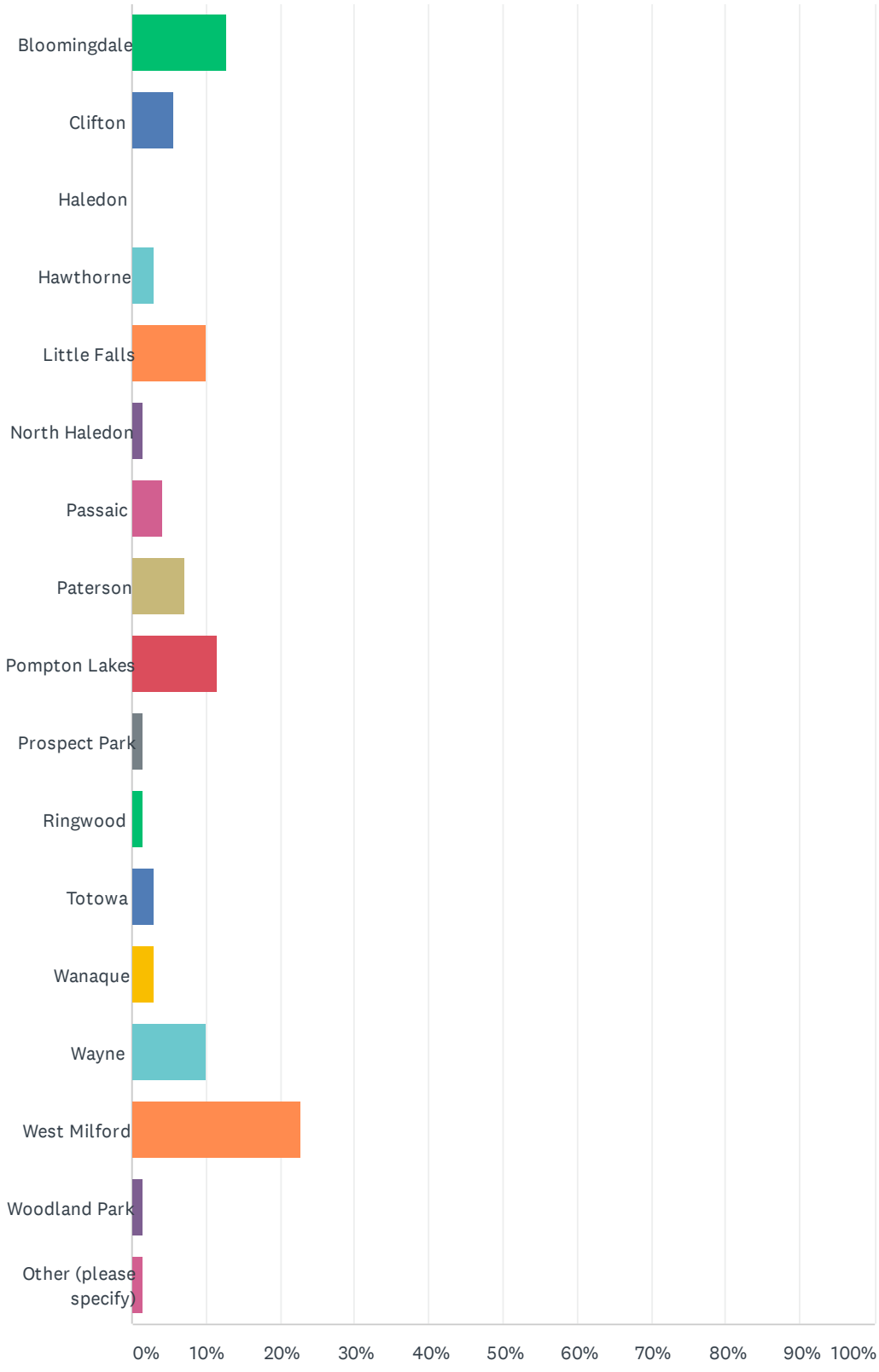
Answered: 79 Skipped: 0


Coastal Storm
Climate Change (other than ...
Dam failure
Drought
Earthquake
Extreme Temperature...
Flooding - Street/Land
Flooding - Stormwater
Flooding - Basement
Flooding - 1st floor or above
Geologic (landslide,...
Severe Weather (tornado,...
Severe Winter Storms...
Wildfire
Sea Level Rise
None
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
Coastal Storm	25.32%	20
Climate Change (other than sea level rise)	20.25%	16
Dam failure	8.86%	7
Drought	20.25%	16
Earthquake	2.53%	2
Extreme Temperature (heat and cold)	31.65%	25
Flooding - Street/Land	56.96%	45
Flooding - Stormwater	44.30%	35
Flooding - Basement	40.51%	32
Flooding - 1st floor or above	7.59%	6
Geologic (landslide, sinkholes, subsidence)	6.33%	5
Severe Weather (tornado, thunderstorm, hail)	51.90%	41
Severe Winter Storms (blizzard, heavy snow, ice)	68.35%	54
Wildfire	8.86%	7
Sea Level Rise	2.53%	2
None	6.33%	5
Other (please specify)	5.06%	4
Total Respondents: 79		

Q2 Please indicate the municipality in which you live:

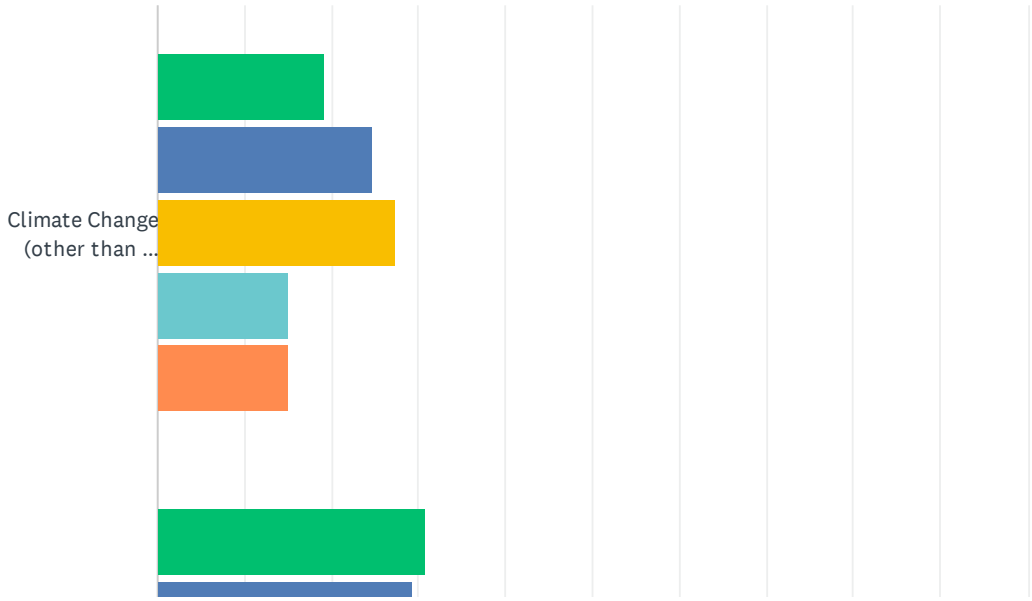
Answered: 70 Skipped: 9

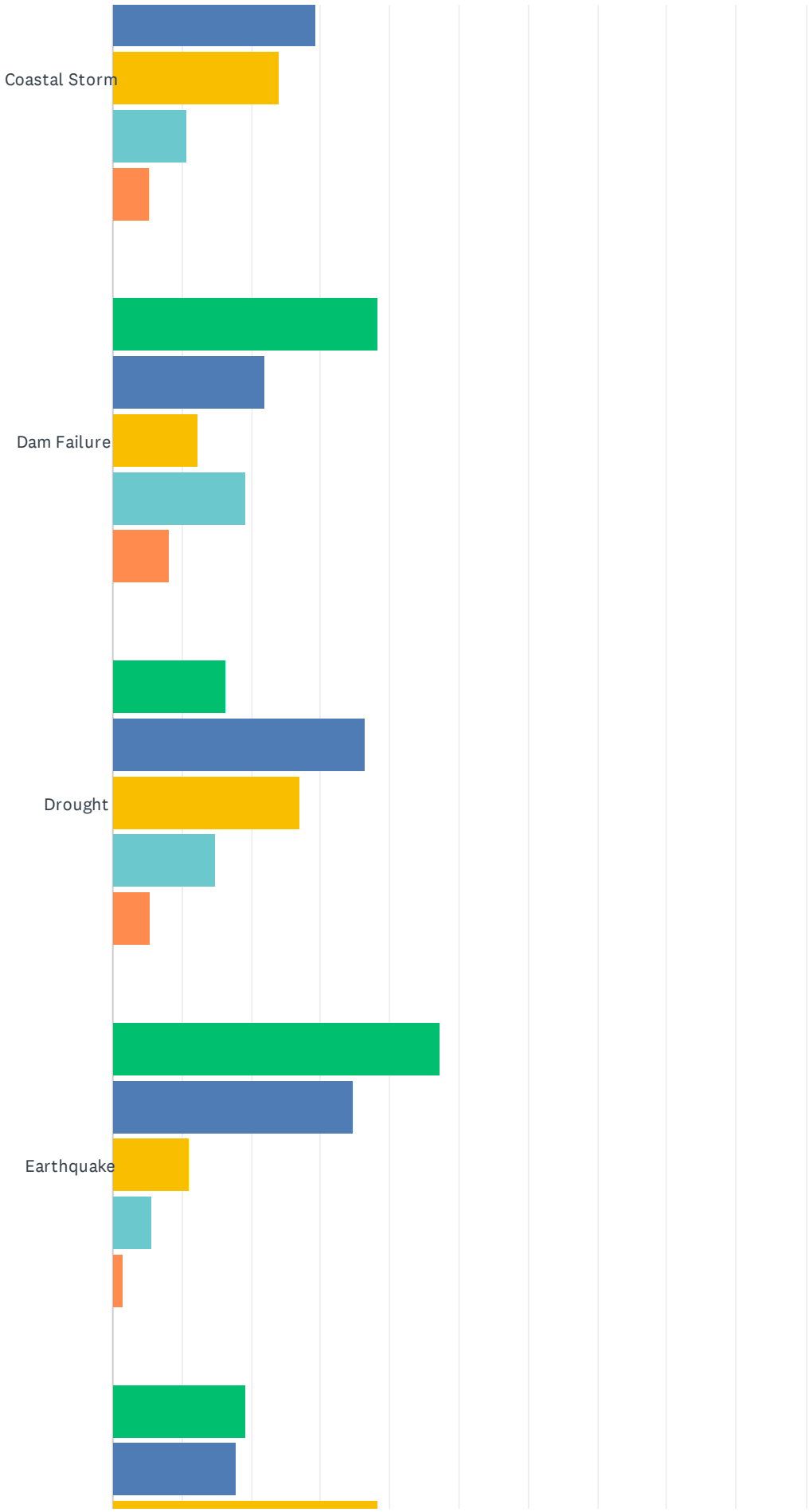

Bloomingdale
Clifton
Haledon
Hawthorne
Little Falls
North Haledon
Passaic
Paterson
Pompton Lakes
Prospect Park
Ringwood
Totowa
Wanaque
Wayne
West Milford
Woodland Park
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

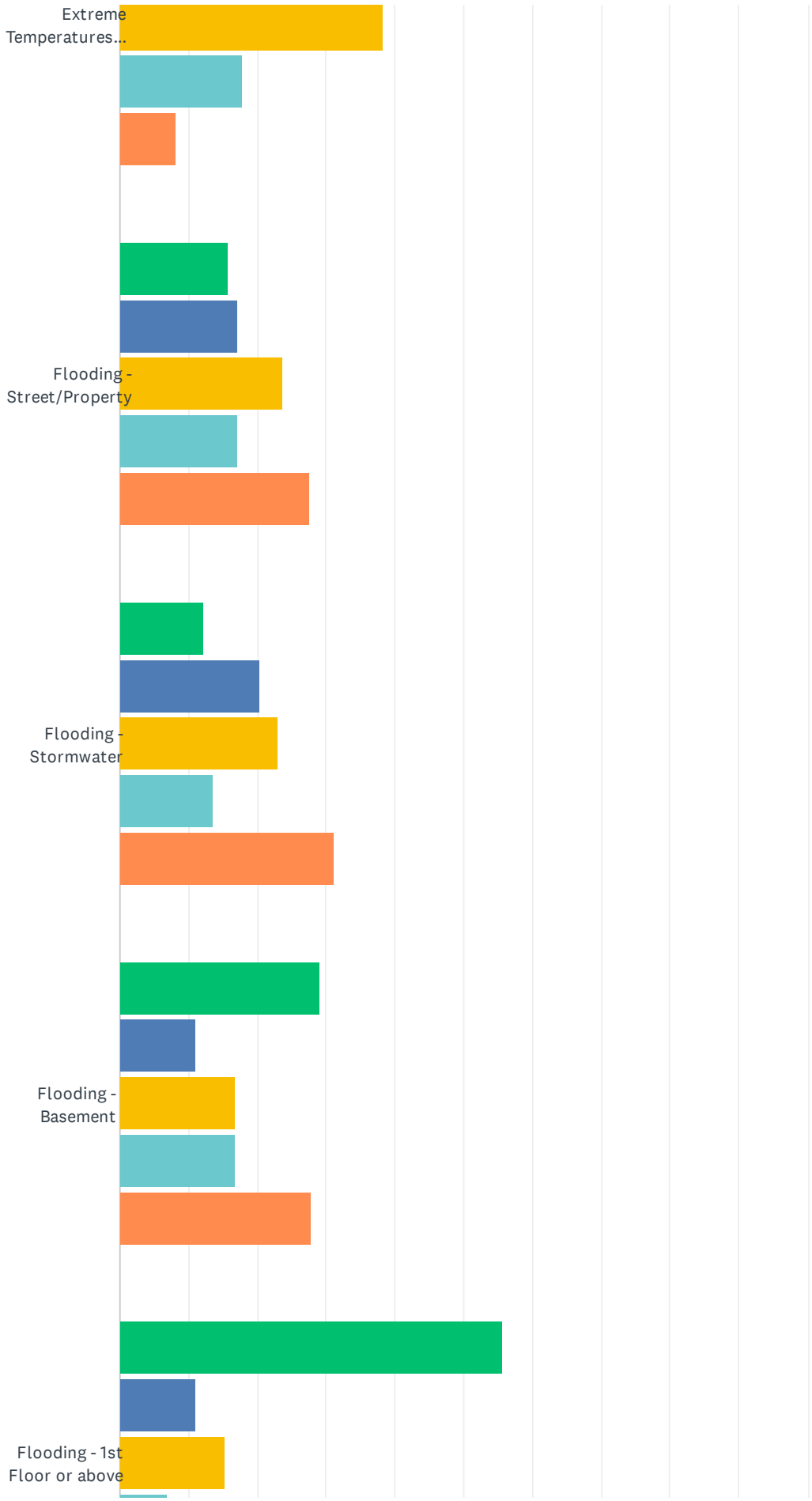
ANSWER CHOICES	RESPONSES	
Bloomingdale	12.86%	9
Clifton	5.71%	4
Haledon	0.00%	0
Hawthorne	2.86%	2
Little Falls	10.00%	7
North Haledon	1.43%	1
Passaic	4.29%	3
Paterson	7.14%	5
Pompton Lakes	11.43%	8
Prospect Park	1.43%	1
Ringwood	1.43%	1
Totowa	2.86%	2
Wanaque	2.86%	2
Wayne	10.00%	7
West Milford	22.86%	16
Woodland Park	1.43%	1
Other (please specify)	1.43%	1
TOTAL		70

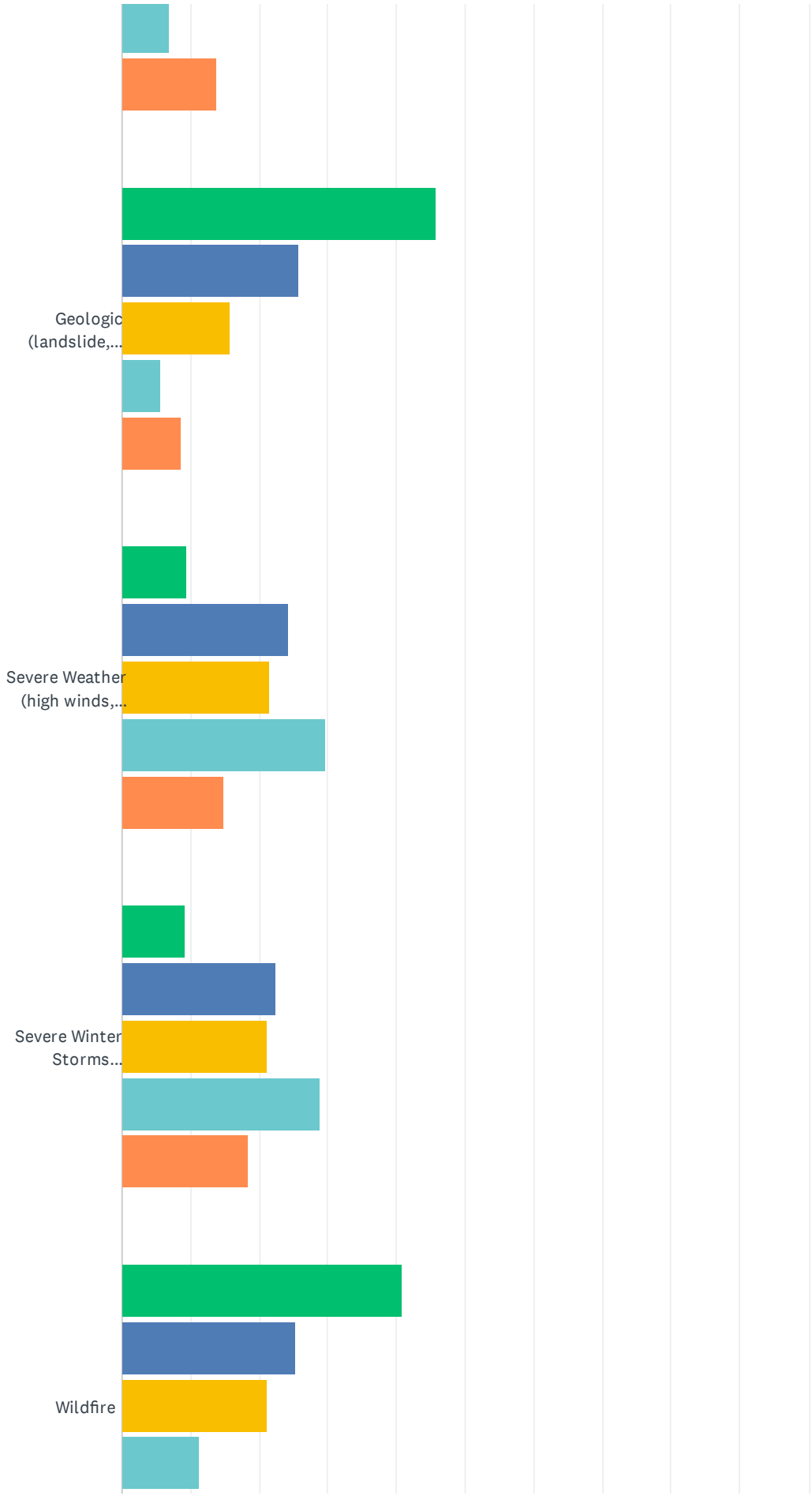
Q3 How concerned are you about the following natural hazards in Passaic County? Please check one for each hazard.

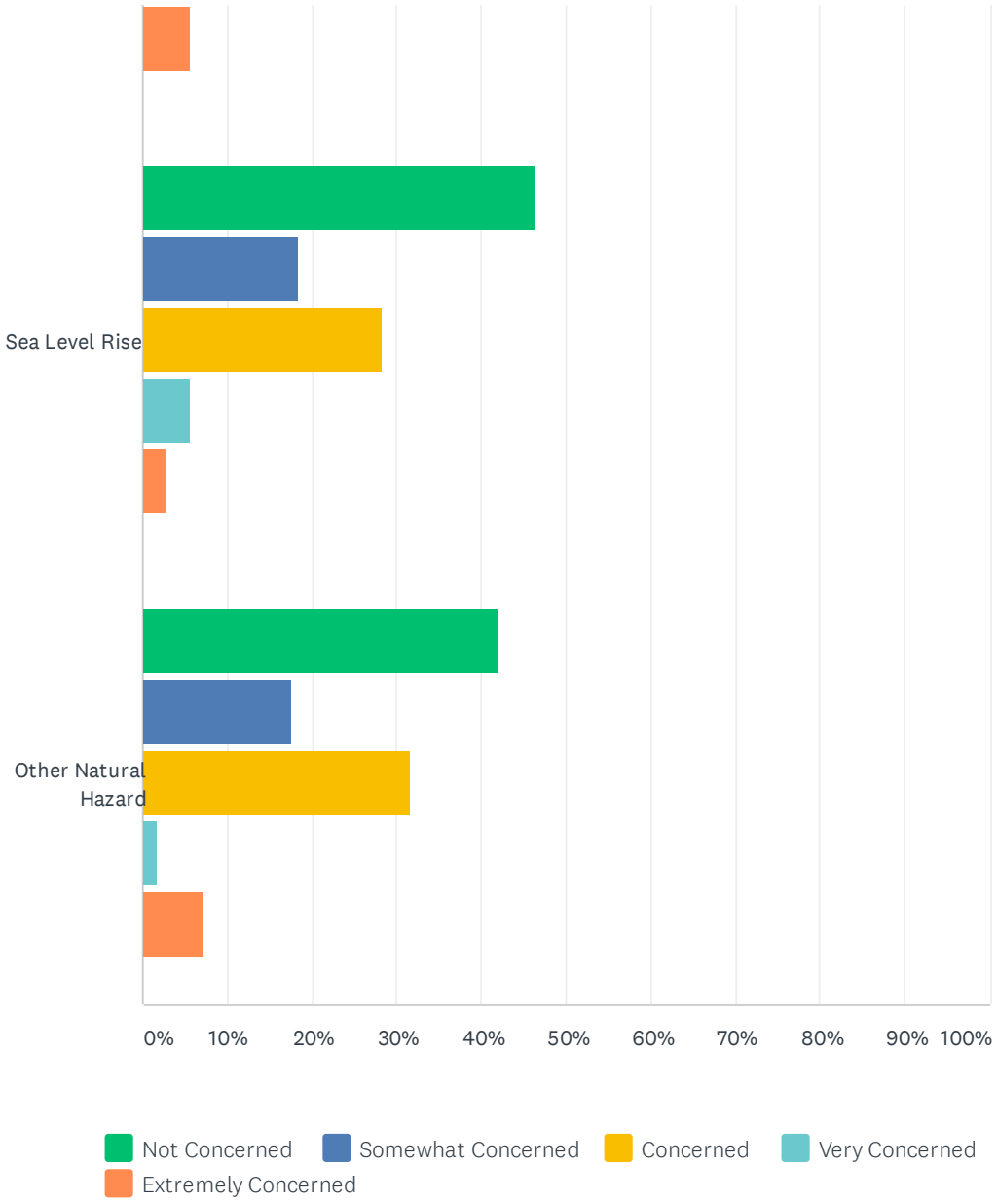
Answered: 78 Skipped: 1




Coastal Storm
Dam Failure
Drought
Earthquake


Extreme Temperatures...
Flooding - Street/Property
Flooding - Stormwater
Flooding - Basement
Flooding - 1st Floor or above


Geologic (landslide,...
Severe Weather (high winds,...
Severe Winter Storms...
Wildfire


Sea Level Rise
Other Natural Hazard
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Not Concerned
Somewhat Concerned
Concerned
Very Concerned
Extremely Concerned

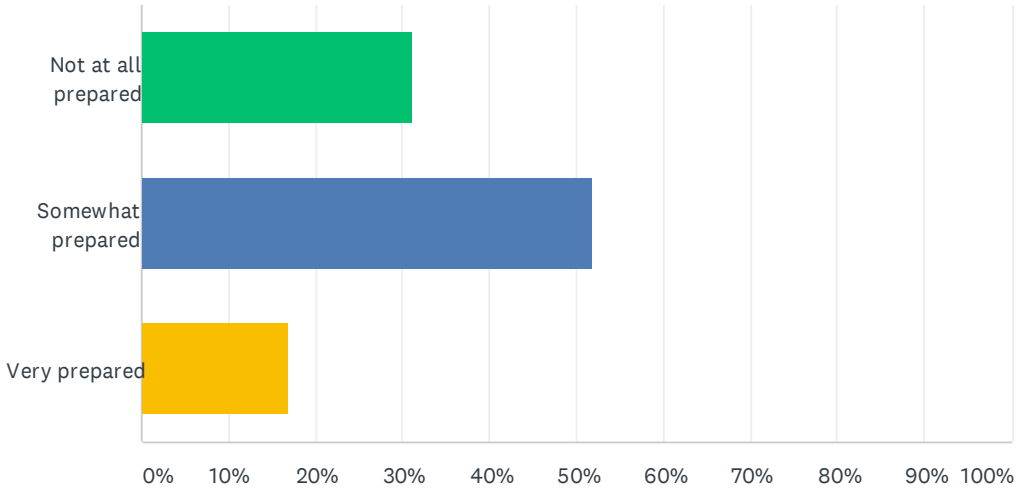
	NOT CONCERNED	SOMEWHAT CONCERNED	CONCERNED	VERY CONCERNED	EXTREMELY CONCERNED	TOTAL RESPONDENTS
Climate Change (other than sea level rise)	19.18% 14	24.66% 18	27.40% 20	15.07% 11	15.07% 11	73
Coastal Storm	30.67% 23	29.33% 22	24.00% 18	10.67% 8	5.33% 4	75
Dam Failure	38.36% 28	21.92% 16	12.33% 9	19.18% 14	8.22% 6	73
Drought	16.22% 12	36.49% 27	27.03% 20	14.86% 11	5.41% 4	74
Earthquake	47.22% 34	34.72% 25	11.11% 8	5.56% 4	1.39% 1	72
Extreme Temperatures (heat and cold)	19.18% 14	17.81% 13	38.36% 28	17.81% 13	8.22% 6	73
Flooding - Street/Property	15.79% 12	17.11% 13	23.68% 18	17.11% 13	27.63% 21	76
Flooding - Stormwater	12.16% 9	20.27% 15	22.97% 17	13.51% 10	31.08% 23	74
Flooding - Basement	29.17% 21	11.11% 8	16.67% 12	16.67% 12	27.78% 20	72
Flooding - 1st Floor or above	55.56% 40	11.11% 8	15.28% 11	6.94% 5	13.89% 10	72
Geologic (landslide, sinkholes, subsidence)	45.71% 32	25.71% 18	15.71% 11	5.71% 4	8.57% 6	70
Severe Weather (high winds, lightning, hail)	9.46% 7	24.32% 18	21.62% 16	29.73% 22	14.86% 11	74
Severe Winter Storms (blizzard, heavy snow, ice)	9.21% 7	22.37% 17	21.05% 16	28.95% 22	18.42% 14	76
Wildfire	40.85% 29	25.35% 18	21.13% 15	11.27% 8	5.63% 4	71
Sea Level Rise	46.48% 33	18.31% 13	28.17% 20	5.63% 4	2.82% 2	71
Other Natural Hazard	42.11% 24	17.54% 10	31.58% 18	1.75% 1	7.02% 4	57

Q4 In the last 10 years, were you evacuated from your home as a result of a disaster (e.g. flooding)? If so, how long were you displaced? Did you go to a shelter?

Answered: 70 Skipped: 9

Q5 How prepared is your household to get along without electricity or natural gas for one to five days?

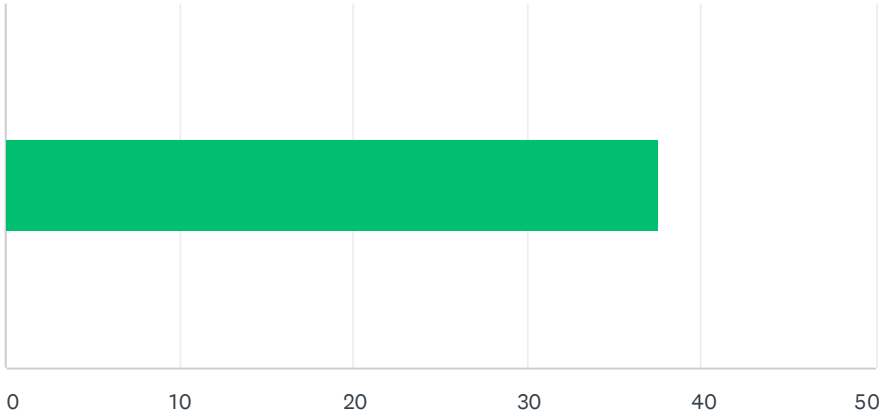
Answered: 77 Skipped: 2



ANSWER CHOICES	RESPONSES	
Not at all prepared	31.17%	24
Somewhat prepared	51.95%	40
Very prepared	16.88%	13
TOTAL		77

Q6 Please rank how prepared you feel and your household are for natural disaster events likely to occur within your community. Rank on a scale of 1 to 5, with 5 representing the most prepared.

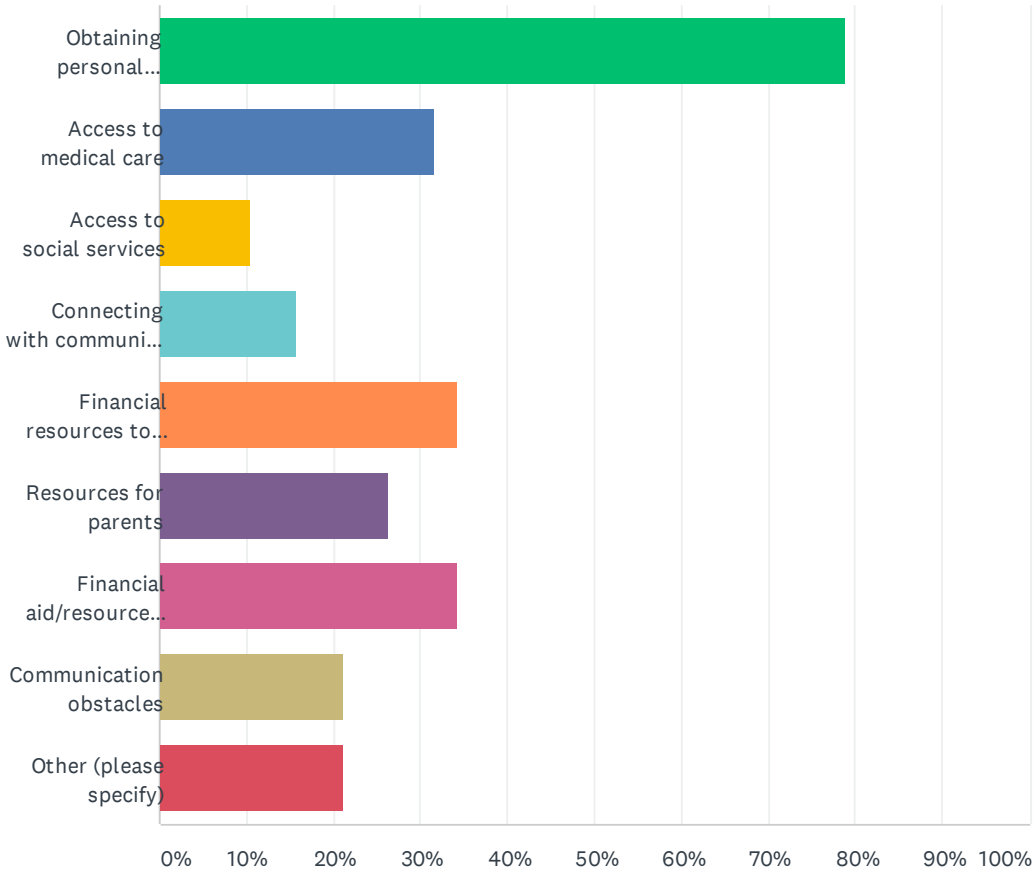
Answered: 77 Skipped: 2



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	38	2,888	77
Total Respondents: 77			

Q7 Given the current COVID-19 pandemic, please share challenges and obstacles you are facing (you may select more than one).

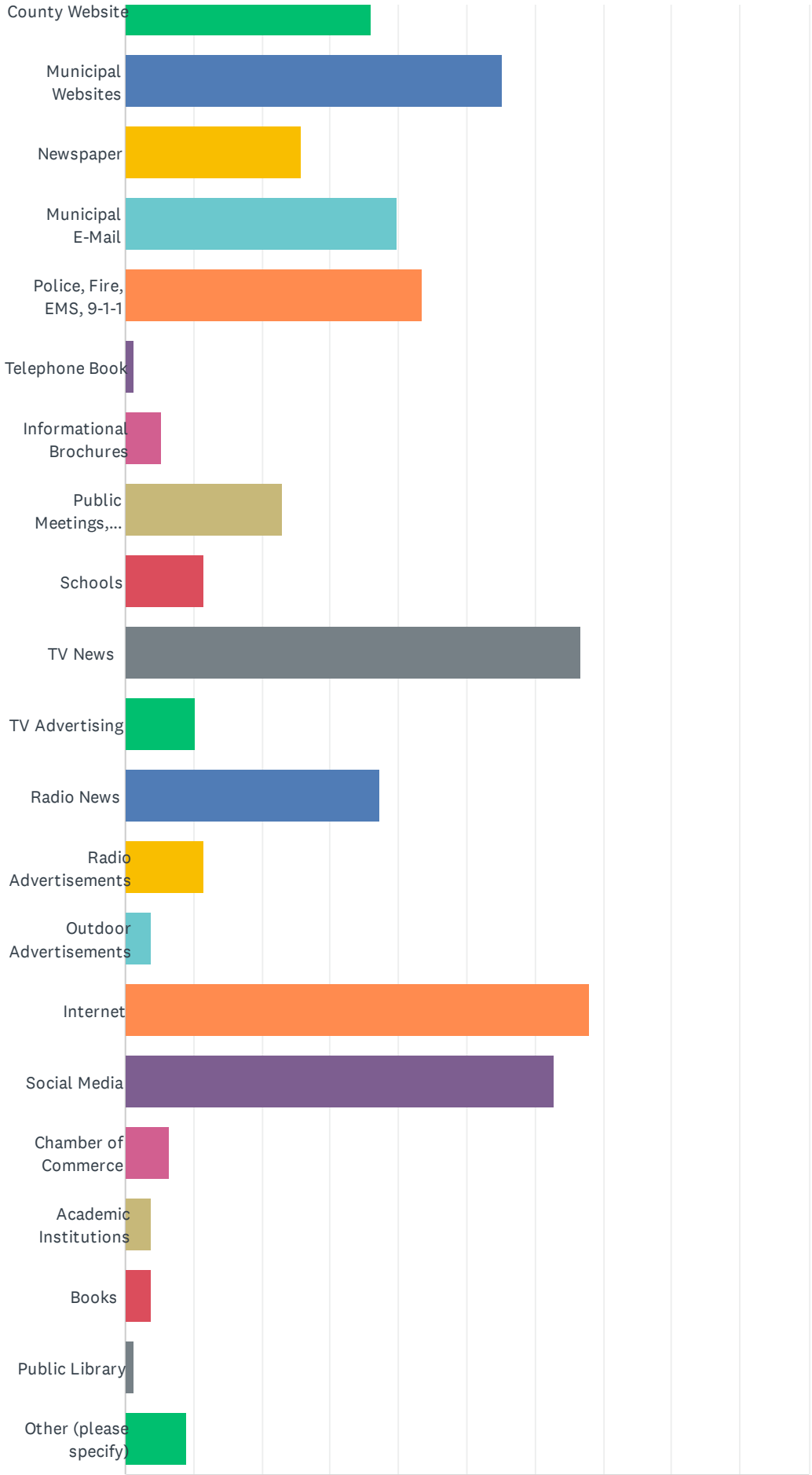
Answered: 38 Skipped: 41



ANSWER CHOICES	RESPONSES	
Obtaining personal protective equipment (gloves, masks)	78.95%	30
Access to medical care	31.58%	12
Access to social services	10.53%	4
Connecting with community officials	15.79%	6
Financial resources to adapt to new conditions	34.21%	13
Resources for parents	26.32%	10
Financial aid/resources for businesses (e.g., loans)	34.21%	13
Communication obstacles	21.05%	8
Other (please specify)	21.05%	8
Total Respondents: 38		

Q8 How do you receive your information concerning a disaster? Check all that apply.

Answered: 78 Skipped: 1


County Website
Municipal Websites
Newspaper
Municipal E-Mail
Police, Fire, EMS, 9-1-1
Telephone Book
Informational Brochures
Public Meetings,...
Schools
TV News
TV Advertising
Radio News
Radio Advertisements
Outdoor Advertisements
Internet
Social Media
Chamber of Commerce
Academic Institutions
Books
Public Library
Other (please specify)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

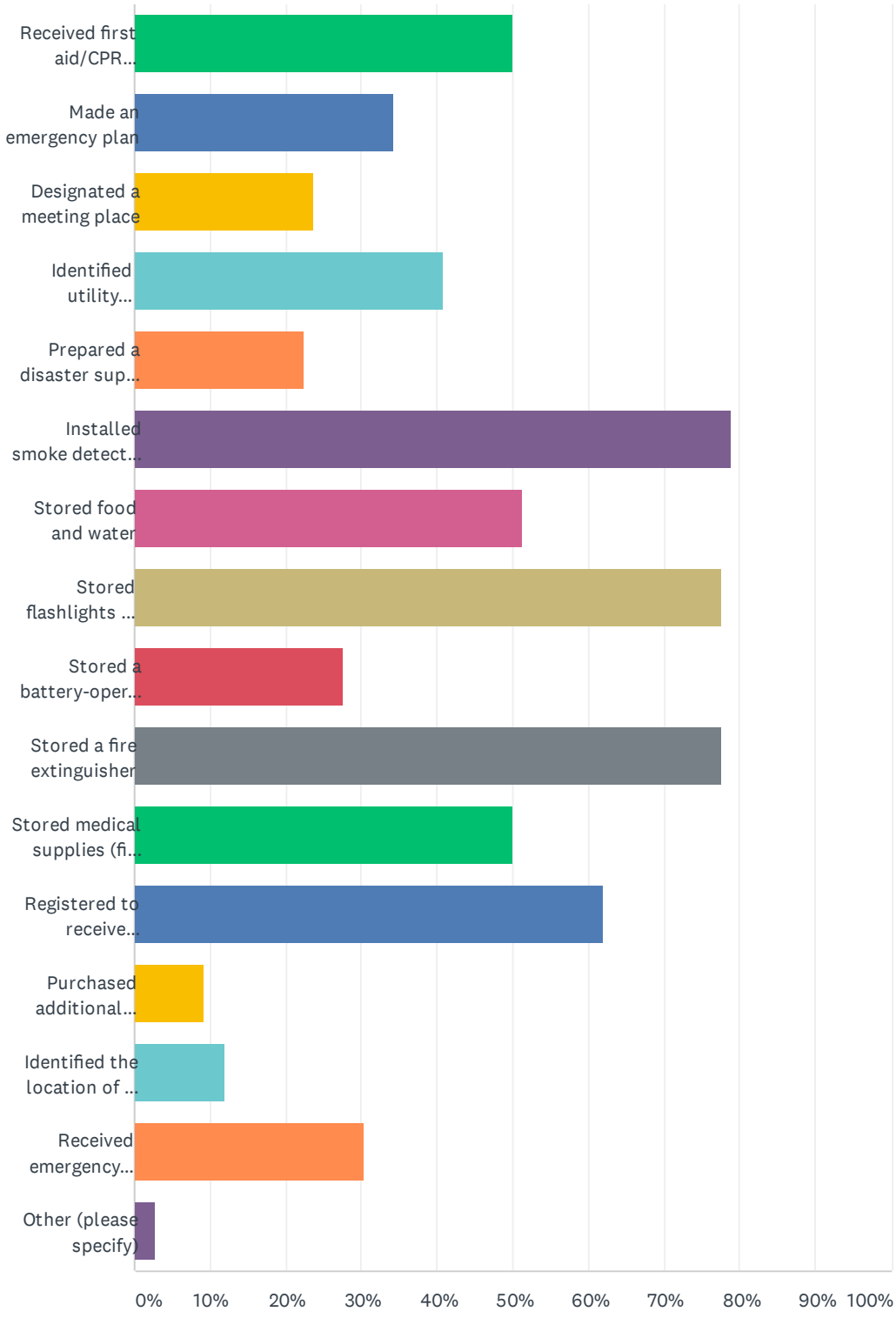
ANSWER CHOICES	RESPONSES	
County Website	35.90%	28
Municipal Websites	55.13%	43
Newspaper	25.64%	20
Municipal E-Mail	39.74%	31
Police, Fire, EMS, 9-1-1	43.59%	34
Telephone Book	1.28%	1
Informational Brochures	5.13%	4
Public Meetings, Workshops, Public Awareness Events	23.08%	18
Schools	11.54%	9
TV News	66.67%	52
TV Advertising	10.26%	8
Radio News	37.18%	29
Radio Advertisements	11.54%	9
Outdoor Advertisements	3.85%	3
Internet	67.95%	53
Social Media	62.82%	49
Chamber of Commerce	6.41%	5
Academic Institutions	3.85%	3
Books	3.85%	3
Public Library	1.28%	1
Other (please specify)	8.97%	7
Total Respondents: 78		

Q9 Of the answers you provided above, what are the top three methods you use?

Answered: 72 Skipped: 7

Q10 Which of the following steps has your household taken to prepare for a local hazard event? Check all that apply.

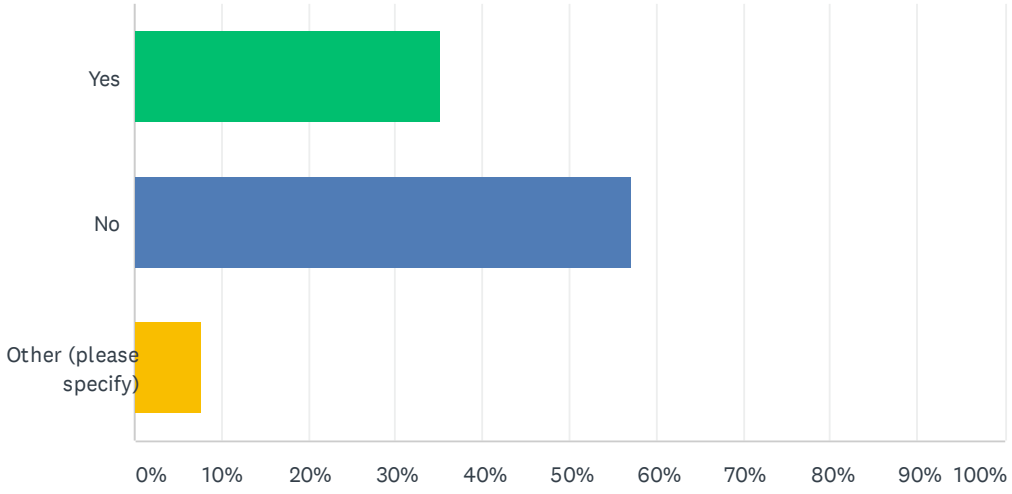
Answered: 76 Skipped: 3


Received first aid/CPR...
Made an emergency plan
Designated a meeting place
Identified utility...
Prepared a disaster sup...
Installed smoke detect...
Stored food and water
Stored flashlights ...
Stored a battery-oper...
Stored a fire extinguisher
Stored medical supplies (fi...
Registered to receive...
Purchased additional...
Identified the location of ...
Received emergency...
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
Received first aid/CPR training	50.00%	38
Made an emergency plan	34.21%	26
Designated a meeting place	23.68%	18
Identified utility shutoffs	40.79%	31
Prepared a disaster supply kit	22.37%	17
Installed smoke detectors on each level of home	78.95%	60
Stored food and water	51.32%	39
Stored flashlights and batteries	77.63%	59
Stored a battery-operated radio	27.63%	21
Stored a fire extinguisher	77.63%	59
Stored medical supplies (first aid kit, medications)	50.00%	38
Registered to receive emergency alerts (i.e. NIXLE)	61.84%	47
Purchased additional insurance to cover losses (i.e. flood insurance)	9.21%	7
Identified the location of the nearest emergency shelter	11.84%	9
Received emergency preparedness information from a government source	30.26%	23
Other (please specify)	2.63%	2
Total Respondents: 76		

Q11 In the past, has your home been damaged by a hazard event? For example, the basement of your home flooded and damaged the hot water heater.

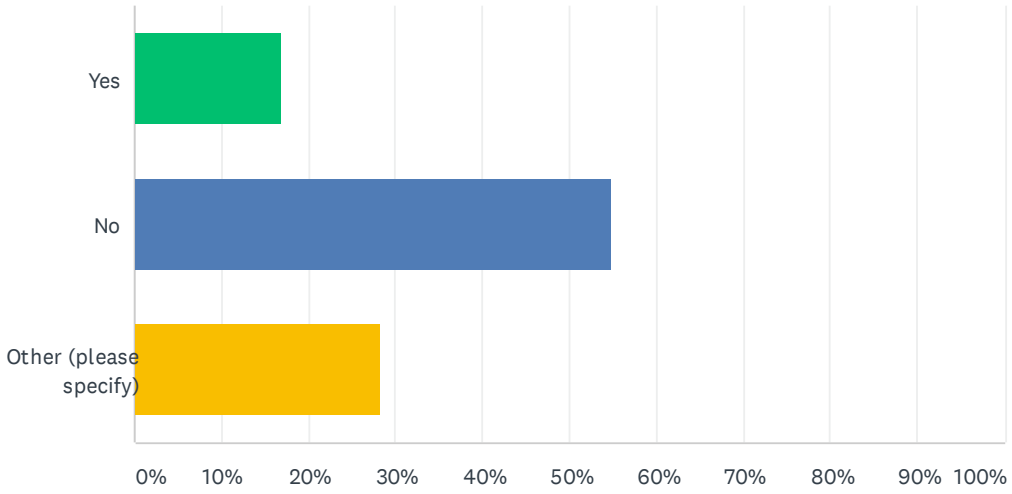
Answered: 77 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	35.06%	27
No	57.14%	44
Other (please specify)	7.79%	6
TOTAL		77

Q12 If you answered "yes" to question #10, did you report the damages to your local police or fire departments or to an emergency management agency?

Answered: 53 Skipped: 26



ANSWER CHOICES	RESPONSES	
Yes	16.98%	9
No	54.72%	29
Other (please specify)	28.30%	15
TOTAL		53

Q13 If you answered "no" to question #10, why did you not report the damages?

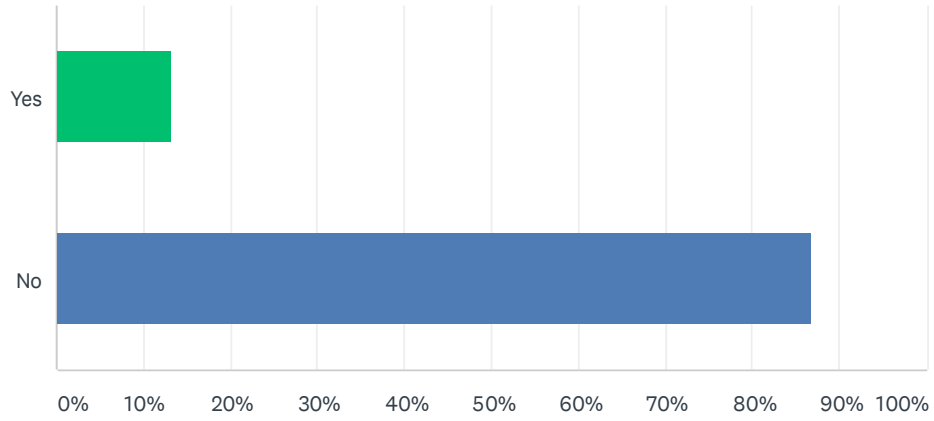
Answered: 38 Skipped: 41

Q14 Please explain the damage your structure sustained and when it occurred.

Answered: 48 Skipped: 31

Q15 To the best of your knowledge, is your property located in a designated floodplain? If you do not know, click here to find out.

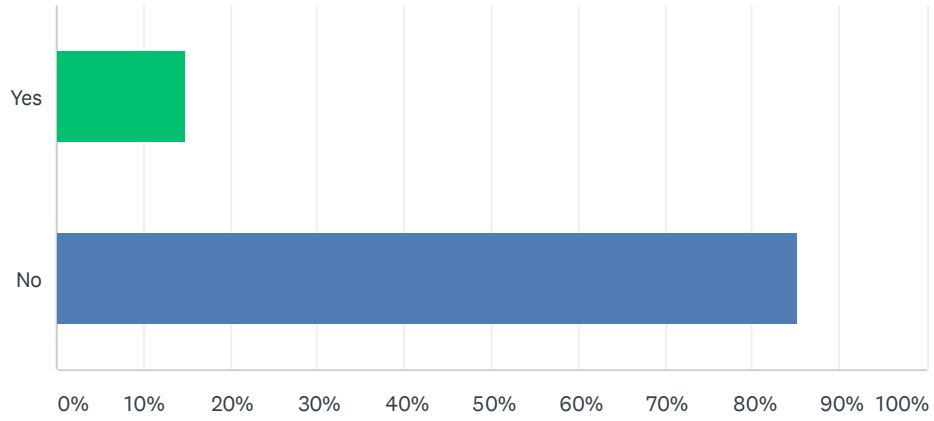
Answered: 76 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes	13.16%	10
No	86.84%	66
TOTAL		76

Q16 If your property is in the floodplain, do you have flood insurance?

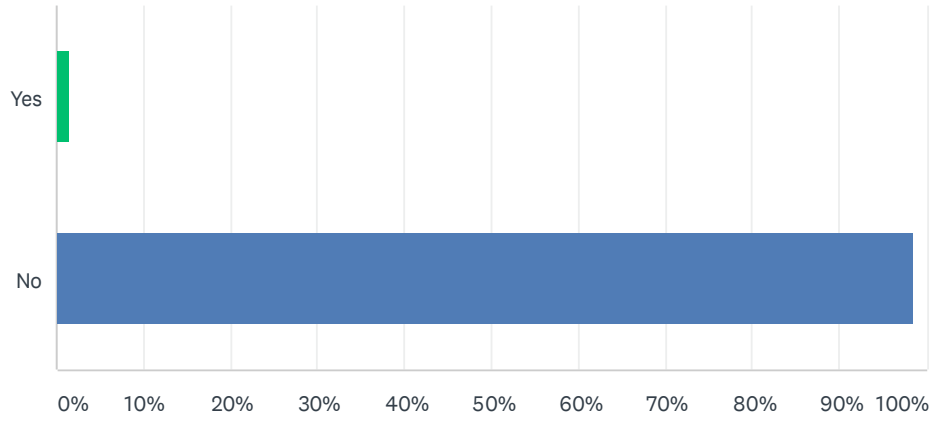
Answered: 47 Skipped: 32



ANSWER CHOICES	RESPONSES	
Yes	14.89%	7
No	85.11%	40
TOTAL		47

Q17 If your property is located outside of the floodplain, do you have flood insurance?

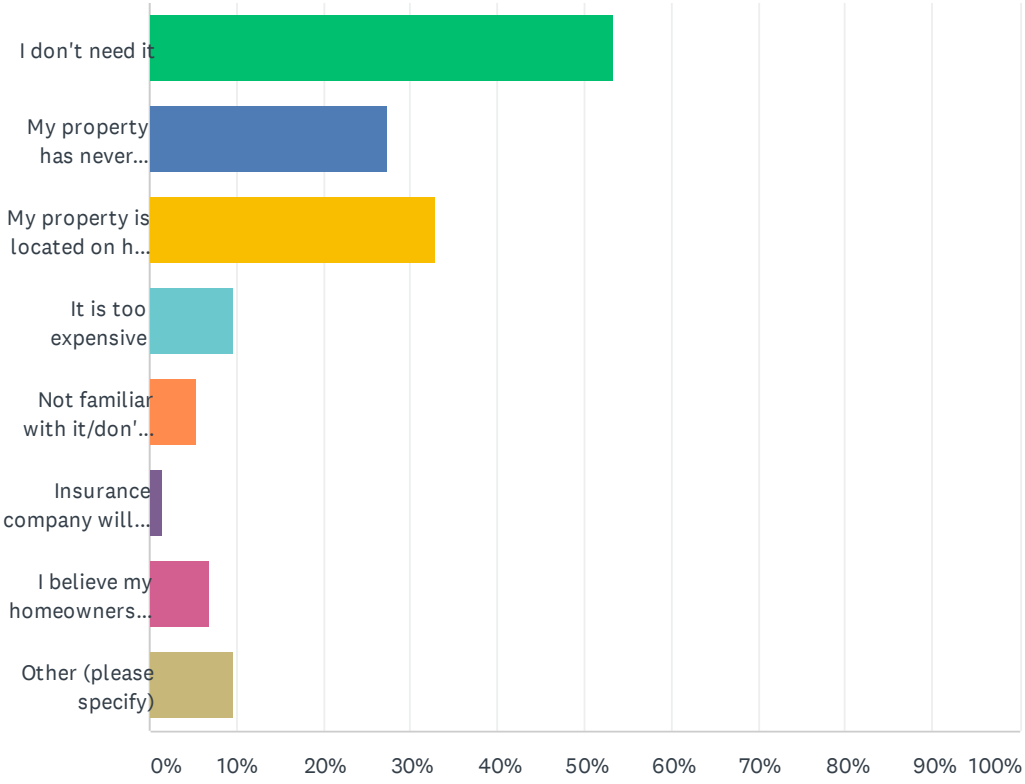
Answered: 71 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	1.41%	1
No	98.59%	70
TOTAL		71

Q18 If you do NOT have flood insurance, what is the primary reason? Check all that apply.

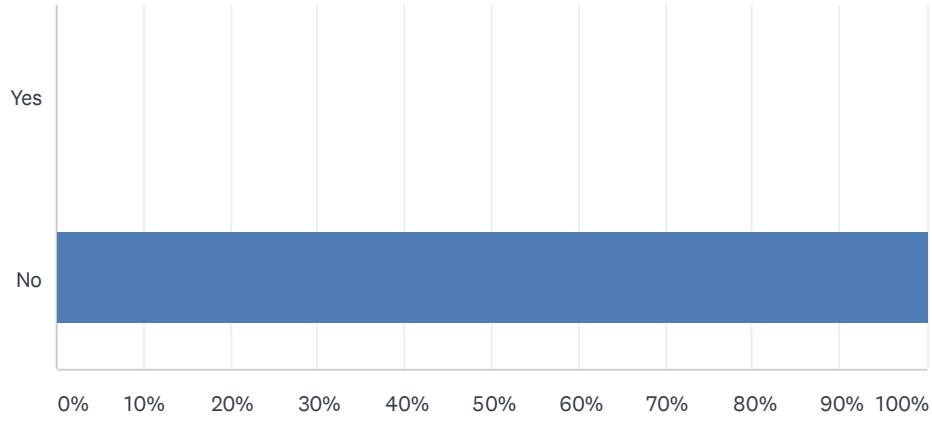
Answered: 73 Skipped: 6



ANSWER CHOICES	RESPONSES	
I don't need it	53.42%	39
My property has never flooded	27.40%	20
My property is located on high ground	32.88%	24
It is too expensive	9.59%	7
Not familiar with it/don't know about it	5.48%	4
Insurance company will not provide	1.37%	1
I believe my homeowners insurance will cover me	6.85%	5
Other (please specify)	9.59%	7
Total Respondents: 73		

Q19 Do you or did you have problems getting homeowners/renters insurance due to risks from natural hazards?

Answered: 77 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	100.00%	77
TOTAL		77

Q20 If you answered "yes" to the previous question, please identify the natural hazard risk that caused you to have problems obtaining homeowners/renters insurance.

Answered: 8 Skipped: 71

Q21 Please identify any specific vulnerabilities that you are aware of in Passaic County (e.g. floodprone areas or specific properties, critical facilities that lack backup power, etc.). Please list street names and other specific identifiers if possible.

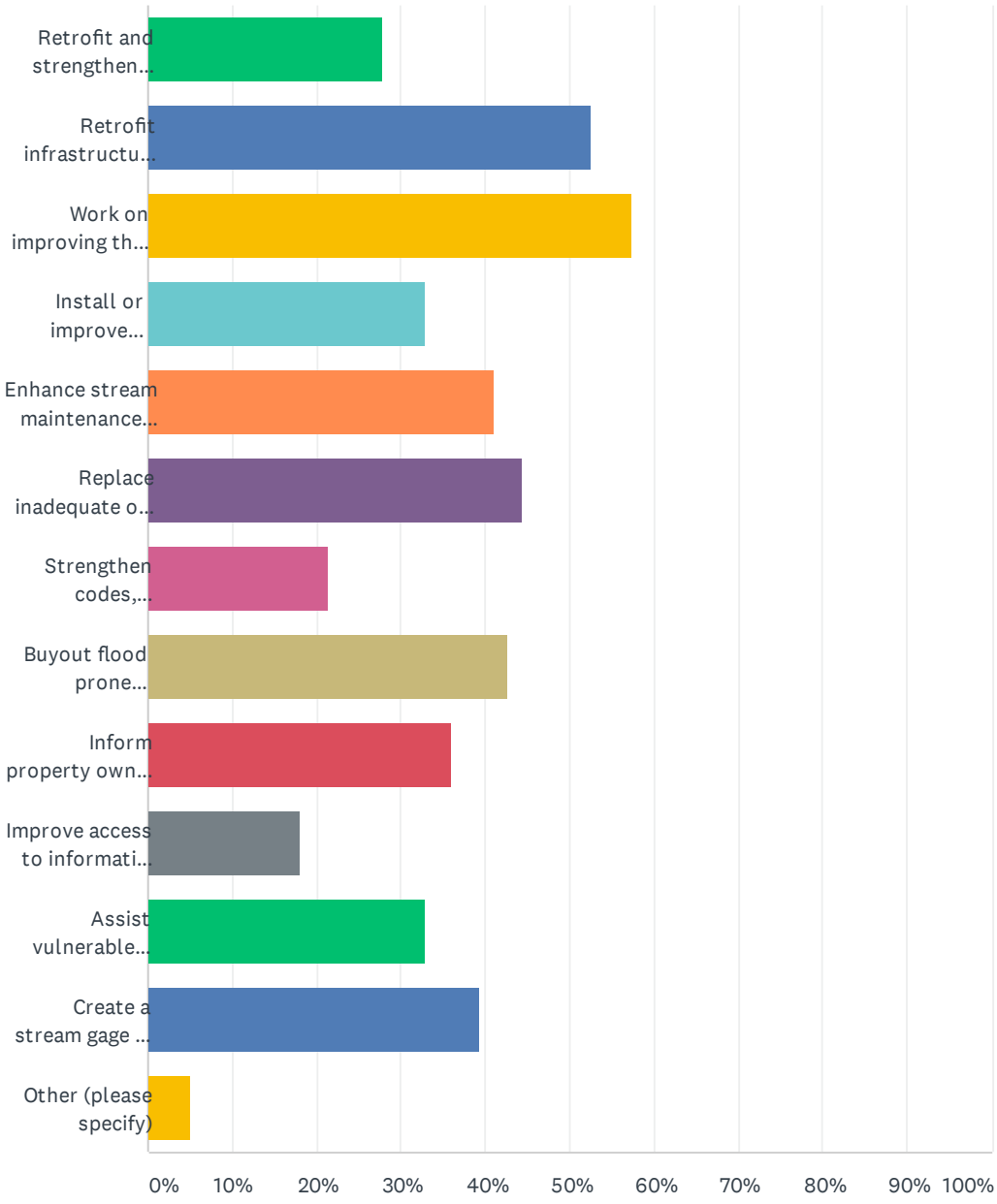
Answered: 38 Skipped: 41

Q22 Please identify any specific vulnerabilities that you area aware of in the municipality you live in (e.g. floodprone areas or specific properties, critical facilities that lack backup power, etc.). Please list street names and other specific identifiers if possible.

Answered: 29 Skipped: 50

Q23 What types of projects do you believe local, county, state, or federal government agencies could be doing to reduce the damage and disruption of disasters in Passaic County? Select your top three choices.

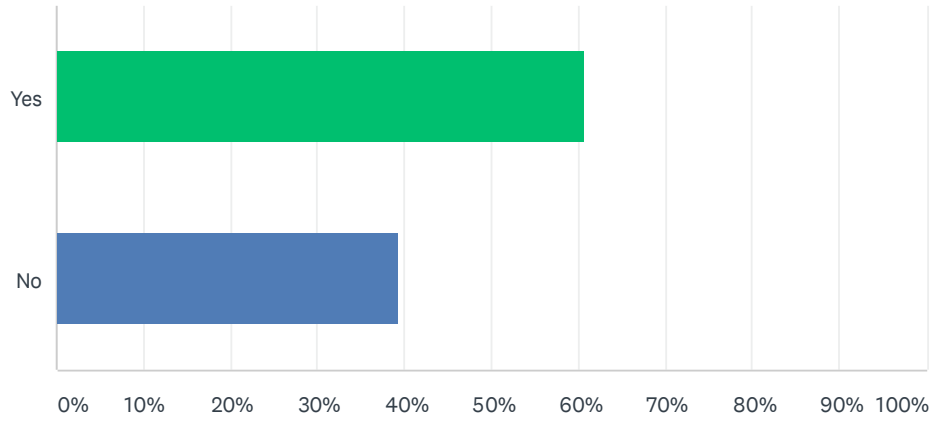
Answered: 61 Skipped: 18



ANSWER CHOICES	RESPONSES	
Retrofit and strengthen essential facilities such as police, schools, and hospitals	27.87%	17
Retrofit infrastructure, such as elevating roadways and improving drainage systems	52.46%	32
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities etc.)	57.38%	35
Install or improve protective structures, such as floodwalls, levees, bulkheads, and firebreaks	32.79%	20
Enhance stream maintenance programs/projects	40.98%	25
Replace inadequate or vulnerable bridges and causeways	44.26%	27
Strengthen codes, ordinances and plans to require higher hazard risk management standards and/or provide greater control over development in high hazard areas	21.31%	13
Buyout flood prone properties and maintain as open space	42.62%	26
Inform property owners of ways they can mitigate damage to their properties	36.07%	22
Improve access to information about hazard risks and high-hazard areas	18.03%	11
Assist vulnerable property owners with securing funding to mitigate their properties	32.79%	20
Create a stream gage and weather monitoring program to provide more accurate data and warnings	39.34%	24
Other (please specify)	4.92%	3
Total Respondents: 61		

Q24 Do you feel that your municipality is doing enough towards flood prevention and mitigation or prevention/mitigation from other hazards?

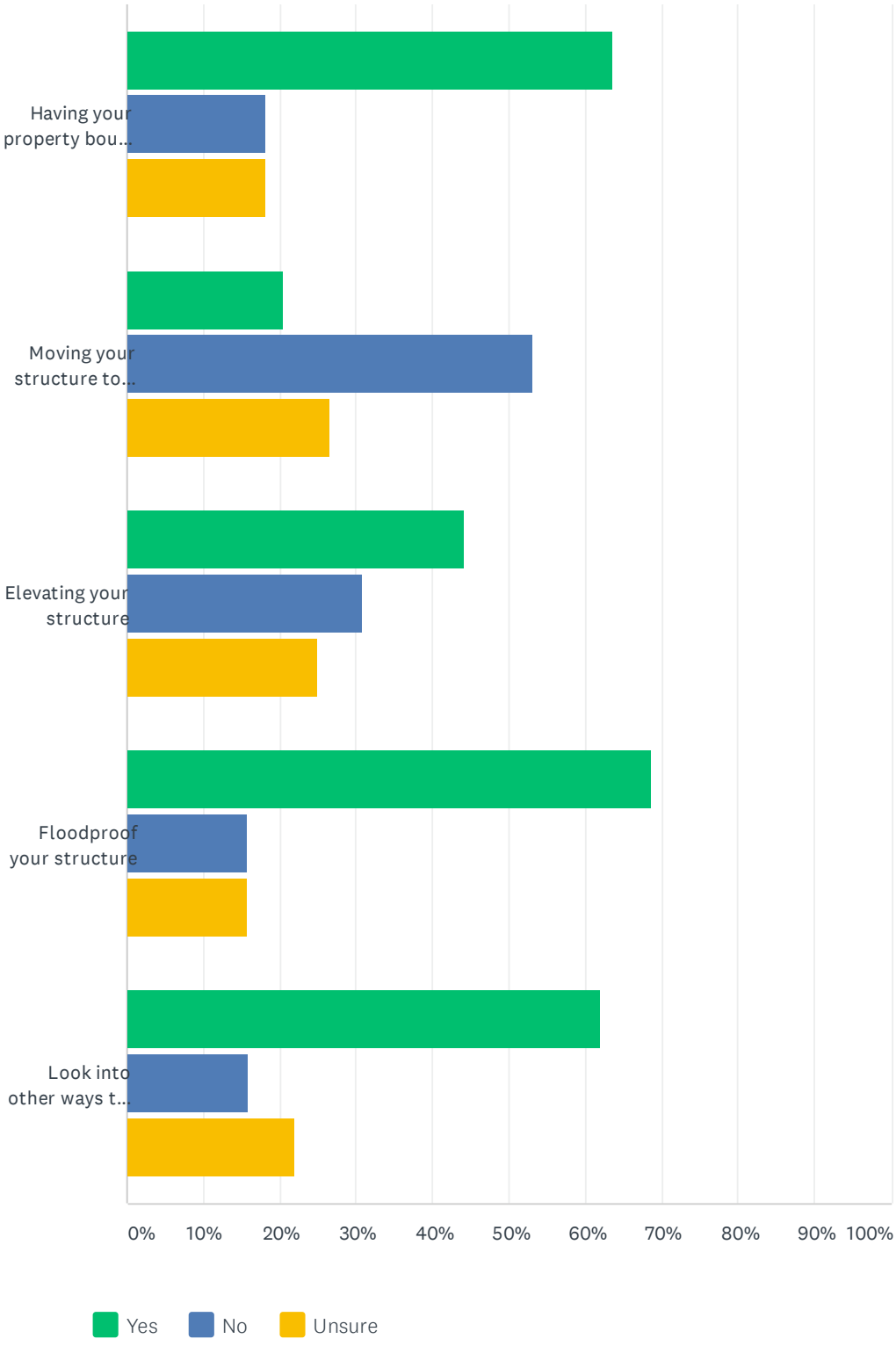
Answered: 56 Skipped: 23



ANSWER CHOICES	RESPONSES	
Yes	60.71%	34
No	39.29%	22
TOTAL		56

Q25 If your property were located in a designated high-hazard area (for example, NFIP flood zone) or had received repeated damages from a natural disaster event, would you consider any of the following options?If your response is dependent on certain factors, such as the funding source, please indicate those factors in the following question.

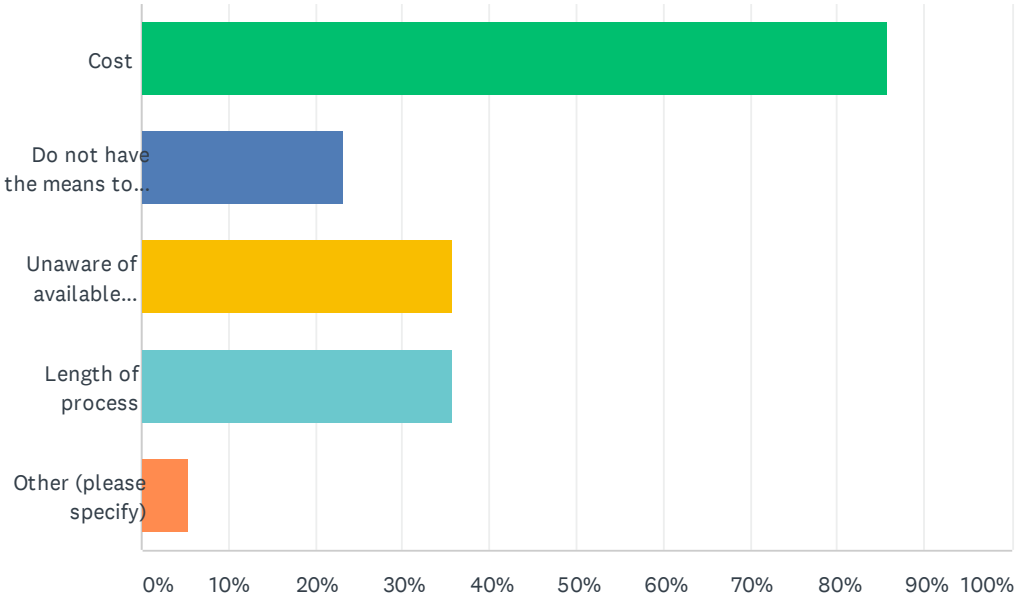
Answered: 56 Skipped: 23


Having your property bou...
Moving your structure to...
Elevating your structure
Floodproof your structure
Look into other ways t...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Yes
No
Unsure

	YES	NO	UNSURE	TOTAL
Having your property bought out	63.64% 35	18.18% 10	18.18% 10	55
Moving your structure to another property or a less risky part of your property	20.41% 10	53.06% 26	26.53% 13	49
Elevating your structure	44.23% 23	30.77% 16	25.00% 13	52
Floodproof your structure	68.63% 35	15.69% 8	15.69% 8	51
Look into other ways to mitigate	62.00% 31	16.00% 8	22.00% 11	50

Q26 Please select the factor(s) that would influence your decision on the mitigation options listed above (buyout/acquisition, relocation, or elevation).

Answered: 56 Skipped: 23



ANSWER CHOICES	RESPONSES	
Cost	85.71%	48
Do not have the means to move/relocate	23.21%	13
Unaware of available programs	35.71%	20
Length of process	35.71%	20
Other (please specify)	5.36%	3
Total Respondents: 56		

Q27 If you have already had to spend money to mitigate your property, how much have you spent and on what measures?

Answered: 22 Skipped: 57

Q28 Which (if any) incentives would motivate you to spend money on protecting your home from the possible impacts of a disaster? Such as lower interest rates, grant funding, waivers, etc.

Answered: 36 Skipped: 43

Q29 Please list any additional types of projects you believe local, county, state or federal government agencies could be doing to reduce the damage and disruption in Passaic County.

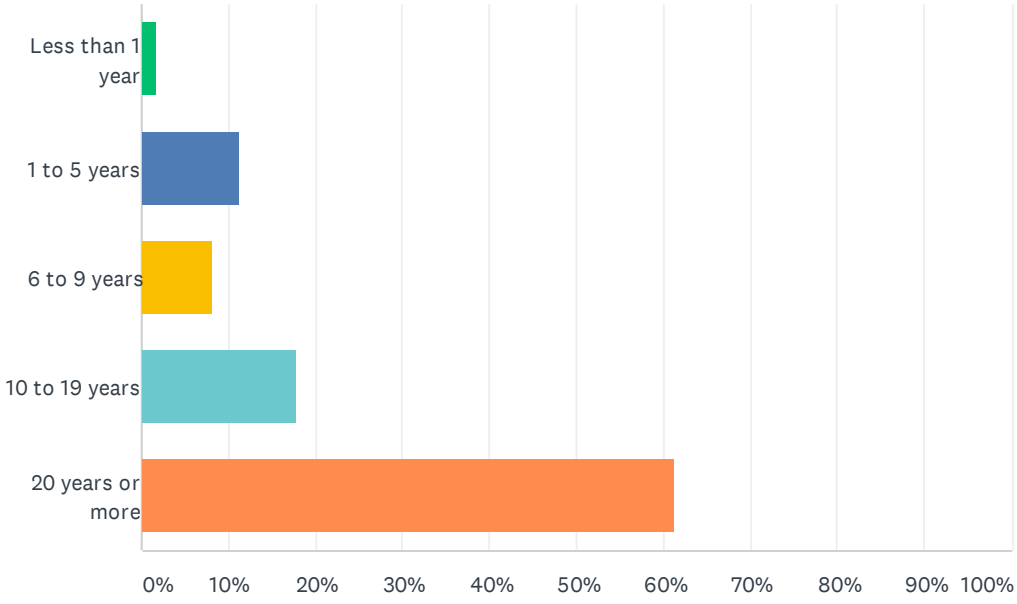
Answered: 31 Skipped: 48

Q30 Do you have any other comments, questions, or concerns regarding hazard mitigation in Passaic County?

Answered: 23 Skipped: 56

Q31 How long have you lived here?

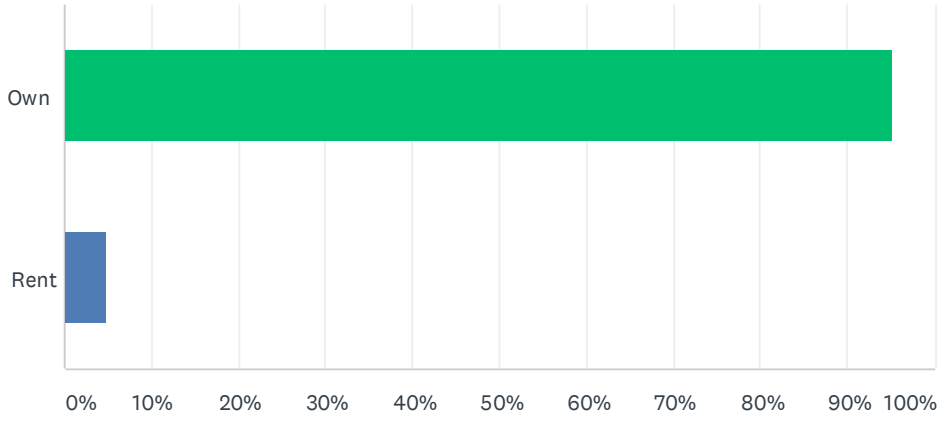
Answered: 62 Skipped: 17



ANSWER CHOICES	RESPONSES	
Less than 1 year	1.61%	1
1 to 5 years	11.29%	7
6 to 9 years	8.06%	5
10 to 19 years	17.74%	11
20 years or more	61.29%	38
TOTAL		62

Q32 Do you own or rent your place of residence?

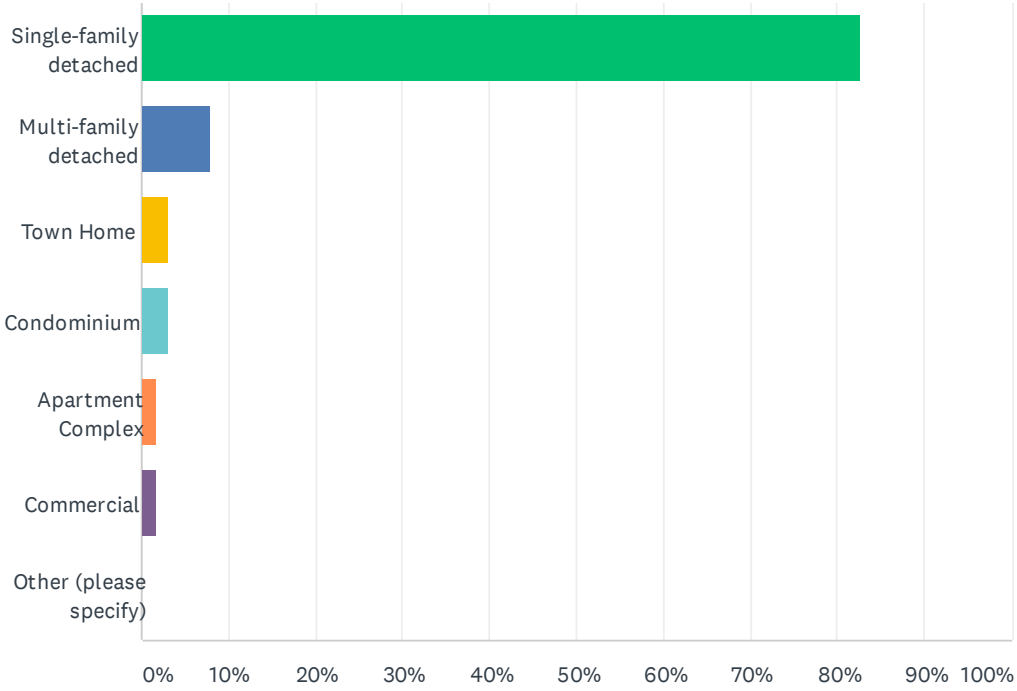
Answered: 63 Skipped: 16



ANSWER CHOICES	RESPONSES	
Own	95.24%	60
Rent	4.76%	3
TOTAL		63

Q33 What type of residence do you live in?

Answered: 63 Skipped: 16



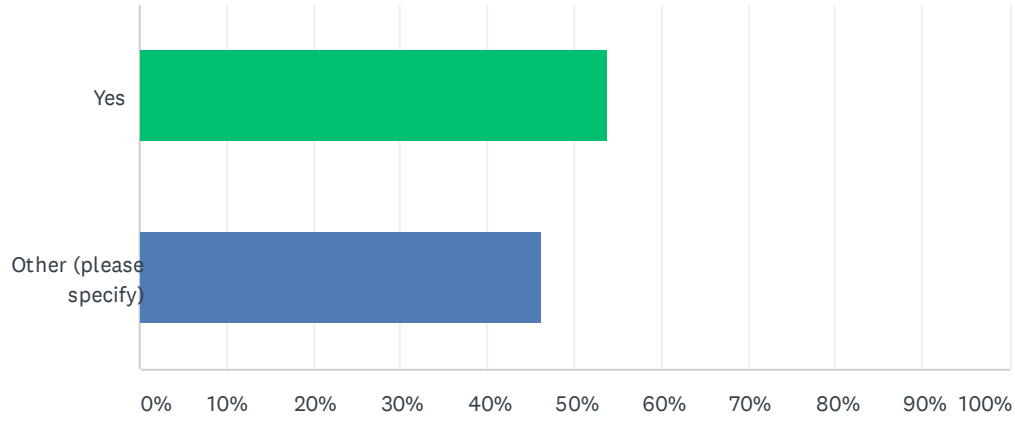
ANSWER CHOICES	RESPONSES	
Single-family detached	82.54%	52
Multi-family detached	7.94%	5
Town Home	3.17%	2
Condominium	3.17%	2
Apartment Complex	1.59%	1
Commercial	1.59%	1
Other (please specify)	0.00%	0
TOTAL		63

Q34 What street is your property on? (optional, will be kept confidential - only used to identify hazard areas such as flooding)

Answered: 45 Skipped: 34

Q35 If you received real estate disclosure information when you moved into your current residence, did your real estate agent or landlord explain the implications of living in a hazard risk zone and did you understand the information they presented?

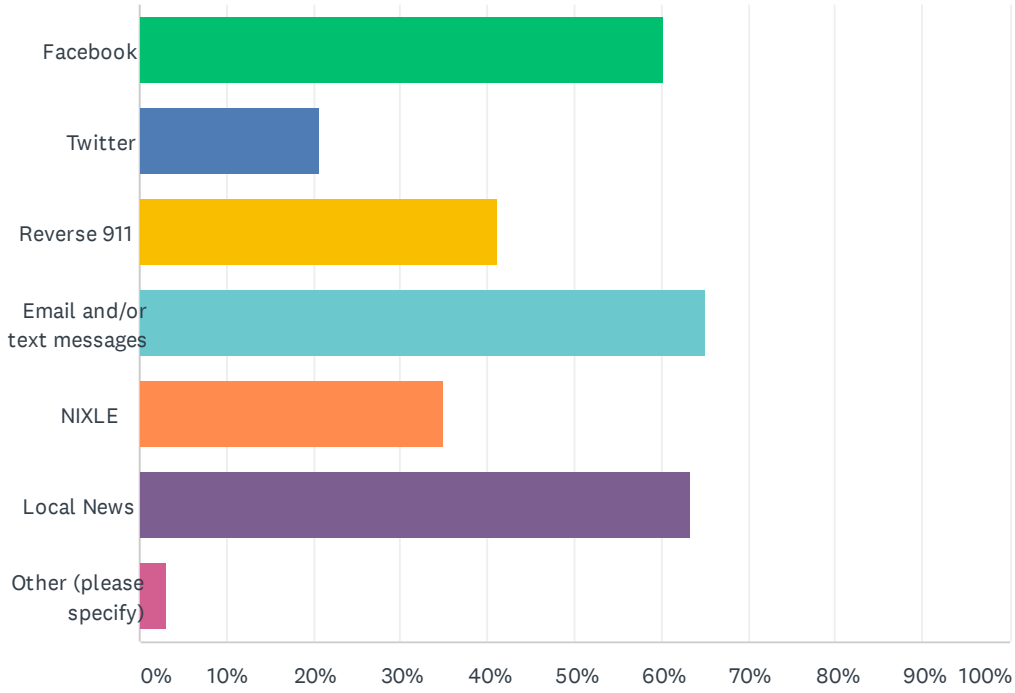
Answered: 39 Skipped: 40



ANSWER CHOICES	RESPONSES	
Yes	53.85%	21
Other (please specify)	46.15%	18
TOTAL		39

Q36 Which of the following digital media outlets do you use and/or subscribe to receive general news and information about Passaic County? Check all that apply.

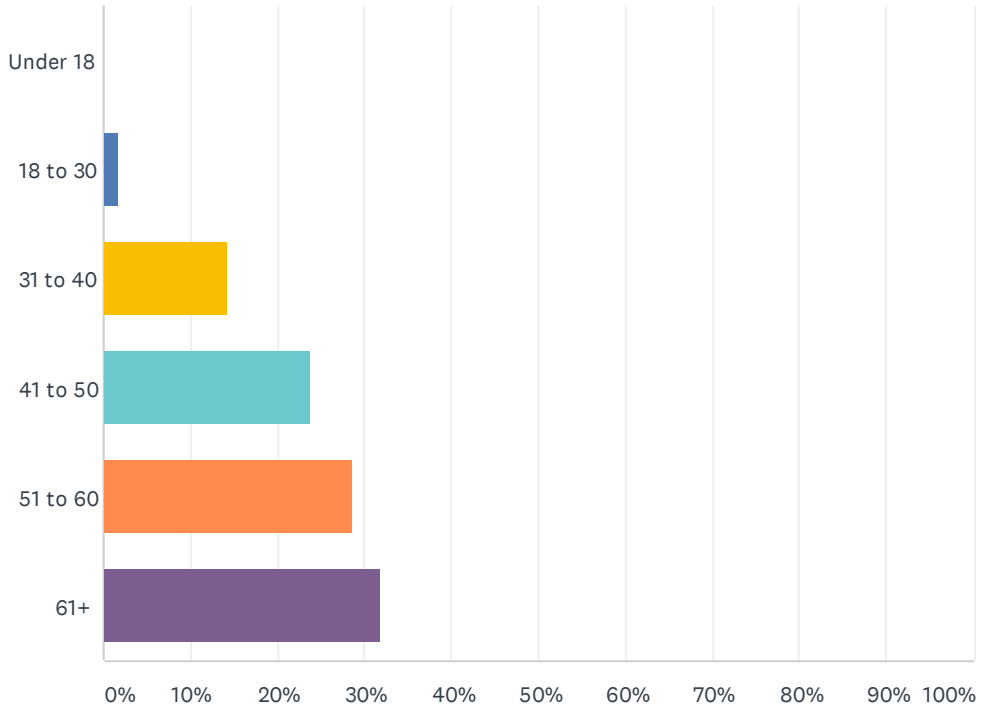
Answered: 63 Skipped: 16



ANSWER CHOICES	RESPONSES	
Facebook	60.32%	38
Twitter	20.63%	13
Reverse 911	41.27%	26
Email and/or text messages	65.08%	41
NIXLE	34.92%	22
Local News	63.49%	40
Other (please specify)	3.17%	2
Total Respondents: 63		

Q37 Please indicate your age range:

Answered: 63 Skipped: 16



ANSWER CHOICES	RESPONSES	
Under 18	0.00%	0
18 to 30	1.59%	1
31 to 40	14.29%	9
41 to 50	23.81%	15
51 to 60	28.57%	18
61+	31.75%	20
TOTAL		63

Q38 What additional resources do you need to better prepare for the next event?

Answered: 12 Skipped: 67

APPENDIX E. RISK ASSESSMENT SUPPLEMENT

This appendix contains supporting information for the Risk Assessment (Section 4) as available. It contains excerpts of the previous events and losses as presented in the 2015 HMP, organized by hazard of concern. This information has been compiled into one appendix for ease of reference; however, it has not been updated and is reproduced as documented in the 2015 plan.

In order to create a more streamlined plan, the 2020 HMP was reorganized and condensed into a practical and more readable document for the public with the goal of providing a plan easier to implement for the County and all municipalities to support future risk reduction. The information in this appendix supplements the information provided in Section 4.3 of this plan.

E.1 CRITICAL FACILITIES AND LIFELINES

The identification of community lifelines across Passaic County provides an enhancement to the 2020 HMP.

FEMA defines a lifeline as: *"providing indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security."* Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occur. The following page is FEMA's factsheet that describes lifelines further.

Homeland Security

Community Lifelines

National Response Framework Update (Fourth Edition)

A lifeline provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security.

Why a lifelines construct?

Decision-makers must rapidly determine the scope, complexity, and interdependent impacts of a disaster. Applying the lifelines construct allows decision-makers to:

- Prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure
- Utilize a common lexicon to facilitate unity of purpose across all stakeholders
- Promote a response that facilitates unity of purpose and better communication amongst the whole community (Federal, state, tribal, territorial, and local governments, and private sector and non-governmental entities)
- Clarify which components of the disaster are complex (multifaceted) and/or complicated (difficult), requiring cross-sector coordination

How will lifelines be used?

- Enhance the ability to gain, maintain, and communicate situational awareness for the whole community in responding to disasters
- Analyze impacts to the various lifelines and develop priority focus areas for each operational period during response
- Identify and communicate complex interdependencies to identify major limiting factors hindering stabilization
- Update the National Response Framework to reflect use of lifelines in response planning

What are the opportunities of lifelines?

- Enable a true unity of effort between government, non-governmental organizations, and the private sector, including infrastructure owners and operators
- Integrate preparedness efforts, existing plans, and identify unmet needs to better anticipate response requirements
- Refine reporting sources and products to enhance situational awareness, best determine capability gaps, and demonstrate progress towards stabilization

Lifelines

Visit us at http://www.fema.gov/national-planning-frameworks

"With honor and integrity, we will safeguard the American people, our homeland, and our values."

E.2 HISTORY OF HAZARD EVENTS IN THE COUNTY

To supplement the information provided in this plan, events documented in the 2015 HMP are included below by hazard of concern. The previous events and losses listed were directly carried over from the 2015 HMP and reflects events identified from 2008 to 2014. With many sources reviewed for the purpose of this HMP, loss and impact information for events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

E.2.1 Coastal Storm Events

Table E-1. Coastal Storm Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
September 6-7, 2008	Tropical Storm Hanna	N/A	N/A	Tropical Storm Hanna impacted northeast New Jersey, making landfall near the Nassau/Suffolk County border on September 6th. Rainfall totals for this event ranged from 2.52 inches to 5.5 inches. The highest sustained wind speed of 39 mph and a peak gust of 45 mph was recorded at Newark Airport (Essex County). Over 10,000 homes and businesses were without power. In Passaic County, winds from the storm downed trees throughout the County. Rainfall totals ranged from 2.79 inches in Little Falls Township to 5.32 inches in West Paterson. Flooding impacting the County. Valley Road in Wayne was inundated with water and impassable. Molly Ann Brook at North Haledon exceeded its flood stage of six feet. The Brook crested at 6.65 feet and fell below its flood stage two hours after it crested.
March 12-15, 2010	Flooding, Heavy Rain and Nor'Easter	N/A	N/A	A Nor'Easter developed off the Delmarva peninsula, producing heavy rain across the northeast U.S. In New Jersey, this event caused widespread flooding across portions of northeast New Jersey. In Passaic County, there was major flooding along the Passaic River which led to evacuations of hundreds of residents in the Bourgh of Totowa and the Township of Little Falls. Rainfall totals ranged between 3.5 and 4.3 inches. Snowmelt contributed to increasing stream flows at many of the stream gates in the northern part of New Jersey. The peak discharges on the Passaic River were 15,800 cubic feet per second at Little Falls. Numerous homes and businesses were closed due to severe flooding. Many bridges and roads were closed for several days. The County

Table E-1. Coastal Storm Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
				had approximately $3 million in property damage.
October 1-2, 2010	Heavy Rain and Flooding (Remnants of Tropical Storm Nicole)	N/A	N/A	Remnants of Tropical Storm Nicole moved up the Atlantic Coast which resulted in heavy and flooding across portions of Bergen, Hudson, and Passaic Counties. Rainfall totals in Passaic County ranged from 3.47 inches in the Township of Wayne to 6.51 inches in the Township of West Milford. Route 46 was closed in the City of Clifton due to flooding.
August 26 – September 5, 2011	Hurricane Irene	DR-4021	Yes	Hurricane Irene moved north along the Atlantic Coast, making landfall near Cape Lookout, North Carolina, on August 27th. The hurricane moved back over open water before making landfall for a second time at Little Egg Inlet in New Jersey on August 28th. This was the first time since 1903 that a hurricane made landfall in New Jersey. Rain fell for an 18-hour period, with totals ranging from six to eight inches across New Jersey. Higher amounts were observed in southwestern, central, and northeastern New Jersey. Irene brought tropical storm force winds, destructive storm surge, and record-breaking freshwater inland flooding across northeast New Jersey. There were thousands of mandatory and voluntary evacuations along the coast and rivers from surge and freshwater flooding, and widespread power outages that lasted for up to two weeks. Thirty-nine of the 94 USGS gages with greater than or equal to 20 years of record had record high peaks. Thirty-three gages experienced peaks equal to or greater than the 100-year recurrence interval. NWS climate site at Newark recorded 8.92 inches of rain. In Passaic County, rainfall totals ranged from 1.1 inches in the City of Clifton to 10.2 inches in the Township of Wayne. Damages in the County included downed trees in the Borough of Totowa, road closures throughout due to flooding, water entering homes near Hromiak Terrace and Dowling Parkway in the Borough of Woodland Park, and water of up to four feet in Hawthorne. One death occurred in Passaic County as a result of Irene. Immediately following the storm, the County had 6,000 displaced residents and three out of the four bridges that crossed the Passaic River were closed.

Table E-1. Coastal Storm Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
				Passaic County experienced the most significant damage from Irene and received the fourth highest amount of significant repetitive loss claims in the U.S. There were approximately 166 severely damaged homes and 39 severely damaged businesses as a result of Irene in the County.
October 26 – November 8, 2012	Hurricane Sandy	DR-4048	Yes	Hurricane Sandy was the costliest natural disaster by far in the State of New Jersey. Record-breaking high tides and wave action combined with sustained winds as high as 60 to 70 mph with wind gusts as high as 80 to 90 mph to batter the State. Statewide, Sandy caused an estimated $29.4 billion in damage, destroyed or significantly damaged 30,000 homes and businesses, affected 42,000 additional structures, and was responsible directly or indirectly for 38 deaths. A new temporary inlet formed in Mantaloking (Ocean County) where some homes were swept away. About 2.4 million households in the State lost power. It would take two weeks for power to be fully restored to homes and businesses that were inhabitable. Also devastated by the storm was New Jersey's shellfish hatcheries including approximately $1 million of losses to buildings and equipment, and product losses in excess of $10,000 at one location alone. As storm surge from Sandy was pushed into the New York and Raritan Bays, sea water piled up within the Hudson River and coastal waterways and wetlands of northeastern New Jersey, including Newark Bay, Passaic and Hackensack Rivers, Kill van Kull, and Arthur Kill. Mandatory evacuations of people living along the coasts and rivers in Union, Essex, and Hudson Counties. Record breaking high tides and wave action was combined with sustained winds of 40 to 60 mph with gusts of 70 to 80 mph. Mandatory evacuations of people living along the coasts and rivers of Union, Essex, and Hudson Counties were conducted. Widespread power outages to more than one million people lasted up to two weeks. Overall, Sandy caused approximately $30 billion in damages in New Jersey and caused 12 deaths in the State. In Passaic County, wind gusts of 80 mph were recorded in Clifton. Rainfall totals ranged from 0.09 inches in Hawthorne to 2.1 inches in Charlotteburg. Two fatalities in the County were a result from this event. It was reported that the County was without power for six days.

Table E-1. Coastal Storm Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
November 7-8, 2012	Nor'Easter	N/A	N/A	A strong Nor'Easter caused high winds along the coast of New Jersey, heavy snow in east-central New Jersey, 10 foot waves along the ocean front and minor tidal flooding along the ocean front. This storm caused setbacks with restoration efforts caused by Hurricane Sandy. Snowfall totals averaged one to five inches in most of the State, with six to 12 inches in Middlesex, Monmouth, and Ocean Counties. The combination of heavy snow and wind brought down trees, poles and power lines. In Passaic County, snowfall totals ranged from three inches in Wayne to 4.5 inches in Clifton.
December 29, 2012	Nor'Easter	N/A	N/A	A deep area of low pressure approached from the southeast and pass just south of Long Island. Snowfall totals in Passaic County ranged from two inches in Wayne to 4.5 inches in West Milford.
February 13-14, 2014	Nor'Easter	N/A	N/A	A low pressure system developed along the northern Gulf Coast and moved near Cape Hatteras and Virginia. It then moved northeast, passing east of Long Island and into the Gulf of Maine. It brought heavy snow and ice to northeast New Jersey. In Passaic County, snowfall totals ranged from 13.3 inches in Bloomingdale to 16.3 inches in West Milford. In Woodland Park, 14 inches of snow was reported and most likely responsible for a roof collapse of an industrial building on Andrews Drive. Another roof collapse of a large retail structure was reported on Route 46. Between one and three inches of freezing rain accumulated in the County as well.

Source: FEMA 2014; NCDC 2014; NWS 2014; SPC 2014; NJ HMP 2014; State of New Jersey 2014; USGS 2011; NHC 2012; NOAA 2012

DR Disaster Declaration (FEMA)
FEMA Federal Emergency Management Agency
Mph miles per hour
N/A Not Applicable
NCDC National Climatic Data Center (NOAA)
NHC National Hurricane Center
NOAA National Oceanic and Atmospheric Administration
NJHMP New Jersey State Hazard Mitigation Plan
SPC Storm Prediction Center
USGS U.S. Geological Survey

E.2.2 Drought

Table E-2. Drought Incidents in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
Summer and Fall 2010	Dry Conditions / Drought	N/A	N/A	During the summer and fall, New Jersey experienced its hottest and 10th driest summer since 1895. The drought watch originally was declared for Bergen, Essex, Hudson, Morris, and Passaic Counties, then was expanded statewide. It was the first time since 2005 that a statewide drought watch had been declared. The drought continued through the summer and into the fall until a wet October led to the cancellation of the drought watch on October 26, 2010. The drought was taxing for New Jersey farmers and the United States Secretary of Agriculture Thomas Vilsack declared all counties in southern, central and northwest New Jersey to be natural disaster areas. The declaration made farm operators eligible for assistance from the Farm Service Agency. The assistance included low interest loans which could cover up to 100% of the dollar value of the crop losses. On July 6, Ridgewood Water imposed a ban on any type of irrigation for the boroughs of Glen Rock and Midland Park, the village of Ridgewood, and the township of Wyckoff. The ban was prompted by recent weather conditions and a resulting increase in demand for water, which had made it difficult to maintain pressure in the water system as well as an adequate reserve of water for fighting fires. On August 5, the NJDEP issued a drought watch for northeast New Jersey. On a statewide average, August 2010 was the 15th driest August on record (dating back to 1895) with 2.37 inches of rain. The meteorological summer was the 10th driest (8.65 inches) on record dating back to 1895 in New Jersey and was also the driest summer since 1966. At the Atlantic City International Airport, it was the fourth driest August (1.09 inches) and fifth driest meteorological summer (5.92 inches) on record. In Trenton, it was the third driest August (0.80 inches) and fifth driest meteorological summer (5.90 inches) on record. Many municipalities in Passaic County experienced reduced water yield due to heat and water stress.
April - June 2012	Drought / Excessive Heat	N/A	N/A	Throughout the months and April and May, the State of New Jersey abnormally dry to moderate drought conditions, including Passaic County. The local state park in Ringwood was on high alert for forest fires. There were extended dry episodes during the month of June 2012. The last 10 days of the month had 90°F or higher temperatures in several locations. The first heat wave began on June 20th. The second heat wave began on June 27th and extended into early

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
				July. Dry conditions in the State struck between June 14th and June 21st. Precipitation for the month of June was much below normal for all of New Jersey.
April 2013	Dry Conditions/ Drought	N/A	N/A	Dry conditions in Passaic County led to high warnings for forest fires. Local brush fires were reported in the County.
November 2013	Drought	N/A	N/A	Northern New Jersey, including Passaic County, was considered to be in a moderate drought at the beginning of November. Portions of the State have been exceedingly dry for the past several months. Some areas of the State saw rainfall deficits of six to nine inches.
August – September 2014	Dry Conditions	N/A	N/A	August 2014 - According to a CoCoRaHS report from the Ringwood station, flower beds need watering and lawns are browning out. The creek is completely dry and the local lake water level is low. Trees are also starting to display browning leaves. September 2014 – According to a CoCoRaHS report from the Ringwood station, soccer fields are dry, brown and dusty. Forest fire warnings on top of Skyline Drive are high. Trees are dropping leaves and shrubs are losing leaves. Reservoirs appear low.

Source: NOAA-NCDC 2014; NJHMP 2014; FEMA 2014; ONJSC 2012; NCDC 2012; U.S. Drought Monitor 2014; Drought Impact Reporter 2014

FEMA Federal Emergency Management Agency

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

ONJSC Office of the New Jersey State Climatologist

E.2.3 Earthquake

Table E-3. Earthquake Events Impacting Passaic County, 2008 to 2014

Date(s) of Event	Magnitude	Location	Losses/Impacts
February 3, 2009	3.0	Victory Gardens (Morris County)	A small earthquake hit northern New Jersey. It was epicentered in Victory Gardens in Morris County; however, it could be felt throughout portions of New Jersey. No damages or injuries were reported. Numerous reports throughout Passaic County of people having felt the earthquake.
February 14, 2009	2.4	Greater New York Area, New Jersey	Numerous reports throughout Passaic County of people having felt the earthquake.
February 10, 2010	2.2	1 km W of Wanaque	Numerous reports throughout Passaic County of people having felt the earthquake.
February 21, 2010	2.6	New Jersey	Numerous reports throughout Passaic County of people having felt the earthquake.
December 25, 2010	2.1	1 km SW of Clifton, NJ	No reference and/or no damage reported
May 8, 2011	1.2	1 km SW of Clifton, NJ	No reference and/or no damage reported
August 23, 2011	5.8	Central Virginia	A moderate earthquake occurred in central Virginia and was felt throughout most of the east, from Georgia to southern Canada and from Indiana to coastal Maine. It was followed by four aftershocks. In New Jersey, the intensity ranged from 1 to 4 (weak to light). Areas underlain by thick silt and clay felt a stronger ground motion than did those where rock was very close to the surface. The quake was felt in South Brunswick and residents were calling 911 wanting to know what happened; some thought it was an explosion. It was also felt in the offices of Alcatel-Lucent in Murray Hill (Union County). Ceiling tiles fell out at a Sears store in Middletown. In Plainfield (Union County), employees in the Park Madison building were evacuated after the tremor. Union County's administration building in Elizabeth reported continuous shaking. In New Brunswick (Middlesex County), employees were evacuated from the County administration building. Atlantic City (Atlantic County) went into emergency mode with evacuations of high rises, hospitals, schools, casinos, and hotels. The County OEM received reports of a crack in a wall in a house and broken water pipe in a building. There was minor scattered power outages reported throughout the state. Numerous residents of Passaic County reported having felt this earthquake.
August 23, 2012	1.2	1.4 km E of Ringwood, NJ	No reference and/or no damage reported
November 5, 2012	2.0	New Jersey	Numerous reports throughout Passaic County of people having felt the earthquake.
July 18, 2014	1.2	4km SW of Ringwood, NJ	No reference and/or no damage reported

Source: NJGWS 2014; USGS 2014; New Jersey State HMP 2014

km Kilometers
HMP Hazard Mitigation Plan
N/A Not Applicable/Not Available
NJ New Jersey
NJGWS New Jersey Geological and Water Survey
OEM Office of Emergency Management

E.2.4 Extreme Temperature

Table E-4. Extreme Temperature Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
July 4 – 7, 2010	Excessive Heat	N/A	N/A	With high pressure in control, high temperatures reached into the 90s for several days. Some locations saw temperatures of 100°F and higher. Several records were broken during this heat wave. There was one fatality in Passaic County as a result of this heat wave. Daily maximum temperatures in the County ranged from 93°F to 106°F.
January 24, 2011	Extreme Cold/Windchill	N/A	N/A	An arctic high pressure system brought in the coldest air mass of the season to New Jersey. Many places saw morning lows that were the coldest during that winter. Northwest winds produced wind chill factors below zero in most of the State. Maximum temperatures in Passaic County ranged from 20°F to 23°F. The minimum temperatures in the County ranged from 1°F in Wayne to -6°F at the Charlotteburg Reservoir.
July 21 – 23, 2011	Excessive Heat	N/A	N/A	A hot and humid air mass produced excessive heat that resulted in day time temperatures to reach between 100°F and 105°F, with time lows in the 80s. Temperatures in Passaic County ranged from 97°F at the Charlotteburg Reservoir to 103°F in Hawthorne.
March – April 2012	Frosts and Freezes	N/A	N/A	Passaic County was included in a USDA declaration (S3249) for frosts, freezes, high winds and hail in the County.
July 18, 2012	Excessive Heat	N/A	N/A	High pressure in the area brought excessive heat to the area. The heat indices reached 105 degrees in the area. In Passaic County, daily maximum temperatures ranged from 96°F to 101°F. The County was included in a USDA declaration (S3487) for drought and heat/excessive heat/high temperature conditions.

Source: *NOAA-NCDC 2014; ONJSC Rutgers University 2013a; MRCC 2014; NWS 2014; NJ Weather & Climate Network 2014; USDA 2014*

°F *degrees Fahrenheit*

FEMA *Federal Emergency Management Agency*

MRCC *Midwestern Regional Climate Center*

NCDC *National Climatic Data Center*

NOAA *National Oceanic and Atmospheric Administration*

NWS *National Weather Service*

ONJSC *Office of the New Jersey State Climatologist*

USDA *U.S. Department of Agriculture*

E.2.5 Flooding

Table E-5. Flooding Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
February 1-2 2008	Heavy Rain / Flash Flooding	N/A	N/A	Heavy rains and subfreezing ground temperatures allowed for increased runoff causing flash flooding across parts of New Jersey. Rainfall totals ranged from one to two inches with isolated reports of over two inches. In Passaic County, a motorist was rescued from their car in Hawthorne due to flash flooding.
September 6-7, 2008	Tropical Storm Hanna	N/A	N/A	Tropical Storm Hanna impacted northeast New Jersey, making landfall near the Nassau/Suffolk County border on September 6th. Rainfall totals for this event ranged from 2.52 inches to 5.5 inches. The highest sustained wind speed of 39 mph and a peak gust of 45 mph was recorded at Newark Airport (Essex County). Over 10,000 homes and businesses were without power. In Passaic County, winds from the storm downed trees throughout the County. Rainfall totals ranged from 2.79 inches in Little Falls Township to 5.32 inches in West Paterson. Flooding impacting the County. Valley Road in Wayne was inundated with water and impassable. Molly Ann Brook at North Haledon exceeded its flood stage of six feet. The Brook crested at 6.65 feet and fell below its flood stage two hours after it crested.
March 12-15, 2010	Flooding, Heavy Rain and Nor'Easter	N/A	N/A	A Nor'Easter developed off the Delmarva peninsula, producing heavy rain across the northeast U.S. In New Jersey, this event caused widespread flooding across portions of northeast New Jersey. In Passaic County, there was major flooding along the Passaic River which led to evacuations of hundreds of residents in the Borough of Totowa and the Township of Little Falls. Rainfall totals ranged between 3.5 and 4.3 inches. Snowmelt contributed to increasing stream flows at many of the stream gates in the northern part of New Jersey. The peak discharges on the Passaic River were 15,800 cubic feet per second at Little Falls. Numerous homes and businesses were closed due to severe flooding. Many bridges and roads were closed for several days. The County had approximately $3 million in property damage.
July 23, 2010	Severe Storms / Flash Flooding	N/A	N/A	Thunderstorms produced heavy rain and flash flooding that impacted most of northeast New Jersey. In Passaic County, a parking garage in Paterson collapsed which caused damage to the vehicles parked inside. The County had approximately $25,000 in property damage.

Table E-5. Flooding Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
October 1-2, 2010	Heavy Rain and Flooding (Remnants of Tropical Storm Nicole)	N/A	N/A	Remnants of Tropical Storm Nicole moved up the Atlantic Coast which resulted in heavy and flooding across portions of Bergen, Hudson, and Passaic Counties. Rainfall totals in Passaic County ranged from 3.47 inches in the Township of Wayne to 6.51 inches in the Township of West Milford. Route 46 was closed in the City of Clifton due to flooding.
August 26 – September 5, 2011	Hurricane Irene	DR-4021	Yes	Hurricane Irene moved north along the Atlantic Coast, making landfall near Cape Lookout, North Carolina, on August 27th. The hurricane moved back over open water before making landfall for a second time at Little Egg Inlet in New Jersey on August 28th. This was the first time since 1903 that a hurricane made landfall in New Jersey. Rain fell for an 18-hour period, with totals ranging from six to eight inches across New Jersey. Higher amounts were observed in southwestern, central, and northeastern New Jersey. Irene brought tropical storm force winds, destructive storm surge, and record-breaking freshwater inland flooding across northeast New Jersey. There were thousands of mandatory and voluntary evacuations along the coast and rivers from surge and freshwater flooding, and widespread power outages that lasted for up to two weeks. Thirty-nine of the 94 USGS gages with greater than or equal to 20 years of record had record high peaks. Thirty-three gages experienced peaks equal to or greater than the 100-year recurrence interval. NWS climate site at Newark recorded 8.92 inches of rain. In Passaic County, rainfall totals ranged from 1.1 inches in the City of Clifton to 10.2 inches in the Township of Wayne. Damages in the County included downed trees in the Borough of Totowa, road closures throughout due to flooding, water entering homes near Hromiak Terrace and Dowling Parkway in the Borough of Woodland Park, and water of up to four feet in Hawthorne. In the City of Paterson, the First Ward Library branch was closed due to major flooding of the Passaic River. Irene caused significant flooding in the City of Paterson along the banks of the Passaic River, causing major impacts to the utility infrastructure, specifically the sewer system. One death occurred in Passaic County as a result of Irene. Immediately following the storm, the County had 6,000 displaced residents and three out of the four bridges that crossed the Passaic River were closed. Passaic County experienced the most significant damage from Irene and received the fourth

Table E-5. Flooding Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
				highest amount of significant repetitive loss claims in the U.S. There were approximately 166 severely damaged homes and 39 severely damaged businesses as a result of Irene in the County.
October 26 – November 8, 2012	Hurricane Sandy	EM-3354; DR-4086	Yes	Hurricane Sandy was the costliest natural disaster by far in the State of New Jersey. Record-breaking high tides and wave action combined with sustained winds as high as 60 to 70 mph with wind gusts as high as 80 to 90 mph to batter the State. Statewide, Sandy caused an estimated $29.4 billion in damage, destroyed or significantly damaged 30,000 homes and businesses, affected 42,000 additional structures, and was responsible directly or indirectly for 38 deaths. A new temporary inlet formed in Mantaloking (Ocean County) where some homes were swept away. About 2.4 million households in the State lost power. It would take two weeks for power to be fully restored to homes and businesses that were inhabitable. Also devastated by the storm was New Jersey's shellfish hatcheries including approximately $1 million of losses to buildings and equipment, and product losses in excess of $10,000 at one location alone. As storm surge from Sandy was pushed into the New York and Raritan Bays, sea water piled up within the Hudson River and coastal waterways and wetlands of northeastern New Jersey, including Newark Bay, Passaic and Hackensack Rivers, Kill van Kull, and Arthur Kill. Mandatory evacuations of people living along the coasts and rivers in Union, Essex, and Hudson Counties. Record breaking high tides and wave action was combined with sustained winds of 40 to 60 mph with gusts of 70 to 80 mph. Mandatory evacuations of people living along the coasts and rivers of Union, Essex, and Hudson Counties were conducted. Widespread power outages to more than one million people lasted up to two weeks. Overall, Sandy caused approximately $30 billion in damages in New Jersey and caused 12 deaths in the State. In Passaic County, wind gusts of 80 mph were recorded in Clifton. Sandy caused significant flooding in the City of Paterson along the banks of the Passaic River, causing major impacts to the utility infrastructure, specifically the sewer system. Rainfall totals ranged from 0.09 inches in the Borough of Hawthorne to 2.1 inches in Charlotteburg. Two fatalities in the County were a result from this event. It was reported that the County was without power for six days.
July 3, 2014	Thunderstorms and Flooding	N/A	N/A	In Passaic County, half-dollar to ping pong ball sized hail fell in Oak Ridge; trees were down in Hawthorne and Oakland, forcing road closures; and rainfall totals reached 2.58 inches in Ringwood.

Table E-5. Flooding Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
July 14-15, 2014	Thunderstorms and Flash Flooding	N/A	N/A	In Passaic County, tree and wires were down on Gould Road in West Milford. In Paterson, River Street was closed due to flooding. Rainfall totals in the County reached 0.8 inches.

Source: FEMA 2014; NCDC 2013; NWS 2014; SPC 2012; NJ HMP 2012; USGS 2011; NHC 2012; NOAA 2012; City of Paterson Master Plan 2014

DR Disaster Declaration (FEMA)

FEMA Federal Emergency Management Agency

Mph miles per hour

N/A Not Applicable

E.2.6 Geological Hazards

Table E-6. Geological Hazard Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
Geological events in Passaic County were not identified between 2008 and 2014				

Source: *NJDEP 2014; NOAA-NCDC 2014*

FEMA *Federal Emergency Management Agency*

NCDC *National Climatic Data Center*

NOAA *National Oceanic and Atmospheric Administration*

E.2.7 Severe Weather

Table E-7. Severe Weather Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
February 1-2 2008	Heavy Rain / Flash Flooding	N/A	N/A	Heavy rains and subfreezing ground temperatures allowed for increased runoff causing flash flooding across parts of New Jersey. Rainfall totals ranged from one to two inches with isolated reports of over two inches. In Passaic County, a motorist was rescued from their car in Hawthorne due to flash flooding.
June 8, 2008	Thunderstorms and Lightning	N/A	N/A	Thunderstorms developed across the region. In the Township of West Milford, lightning struck a home and caused a fire. Property damage was estimated at $5,000.
August 11, 2008	Severe Thunderstorms	N/A	N/A	Isolated severe thunderstorms developed over northeast New Jersey. In the City of Clifton, lightning struck a home, collapsing the chimney. Another home was struck in the City, causing the roof to catch fire, destroying the roof and damaging the second story of the house. Property damage was estimated at $60,000.
September 6-7, 2008	Tropical Storm Hanna	N/A	N/A	Tropical Storm Hanna impacted northeast New Jersey, making landfall near the Nassau/Suffolk County border on September 6th. Rainfall totals for this event ranged from 2.52 inches to 5.5 inches. The highest sustained wind speed of 39 mph and a peak gust of 45 mph was recorded at Newark Airport (Essex County). Over 10,000 homes and businesses were without power. In Passaic County, winds from the storm downed trees throughout the County. Rainfall totals ranged from 2.79 inches in Little Falls Township to 5.32 inches in West Paterson. Flooding impacting the County. Valley Road in Wayne was inundated with water and impassable. Molly Ann Brook at North Haledon exceeded its flood stage of six feet. The Brook crested at 6.65 feet and fell below its flood stage two hours after it crested.
June 30, 2009	Thunderstorms	N/A	N/A	Thunderstorms impacted portions of northeast New Jersey, producing lighting and wind damage as well as large hail and flash flooding. In the Township of Little Falls, lightning struck a house that resulted in a fire. Property damage was estimated at $8,000.
July 29, 2009	Severe Thunderstorms and Lightning	N/A	N/A	Severe thunderstorms struck across northeast New Jersey. Some storms produced heavy rain which led to flash flooding. In Passaic County, lightning struck two homes in the Borough of Totowa, causing $10,000 in property damage.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
August 5, 2009	Severe Thunderstorms and Lightning	N/A	N/A	Thunderstorms impacted portions of northeastern New Jersey, causing numerous lightning strikes in the area of the Borough of Hawthorne. One strike in the Borough resulted in a transformer fire. The auditorium of Eastern Christian High School was impacted by a direct strike. A house was struck that resulted in a two-foot gap in the roof. Two other strikes were reported in the Borough as well. Property damage was estimated at $12,000.
March 12 – April 15, 2010	Severe Storms and Flooding	DR-1897	Yes	A Nor'Easter developed off the Delmarva peninsula, producing heavy rain across the northeast U.S. In New Jersey, this event caused widespread flooding across portions of northeast New Jersey. In Passaic County, there was major flooding along the Passaic River which led to evacuations of hundreds of residents in the Borough of Totowa and the Township of Little Falls. Rainfall totals ranged between 3.5 and 4.3 inches. Snowmelt contributed to increasing stream flows at many of the stream gates in the northern part of New Jersey. The peak discharges on the Passaic River were 15,800 cubic feet per second at Little Falls. Numerous homes and businesses were closed due to severe flooding. Many bridges and roads were closed for several days. The County had approximately $3 million in property damage.
July 23, 2010	Severe Storms / Flash Flooding	N/A	N/A	Thunderstorms produced heavy rain and flash flooding that impacted most of northeast New Jersey. In Passaic County, a parking garage in Paterson collapsed which caused damage to the vehicles parked inside. The County had approximately $25,000 in property damage.
October 1-2, 2010	Heavy Rain and Flooding (Remnants of Tropical Storm Nicole)	N/A	N/A	Remnants of Tropical Storm Nicole moved up the Atlantic Coast which resulted in heavy and flooding across portions of Bergen, Hudson, and Passaic Counties. Rainfall totals in Passaic County ranged from 3.47 inches in the Township of Wayne to 6.51 inches in the Township of West Milford. Route 46 was closed in the City of Clifton due to flooding.
December 1, 2010	High Wind	N/A	N/A	High winds in Passaic County knocked down a tree in the Township of West Milford. The tree fell onto a car, killing one person. Across the region, the strong winds knocked down trees and limbs, which caused scattered power outages. The County had approximately $20,000 in property damage.
August 21, 2011	Severe Thunderstorms and Lightning	N/A	N/A	Isolated severe thunderstorms impacted northeast New Jersey. In Passaic County, lightning struck a home in the Township of West Milford causing a fire. In Ringwood Manor, a large tree fell across Sloatsburg Road, forcing it to close. The estimated wind

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
				was 70 mph. Property damage was estimated at $20,000.
August 26 – September 5, 2011	Hurricane Irene	DR-4021	Yes	Hurricane Irene moved north along the Atlantic Coast, making landfall near Cape Lookout, North Carolina, on August 27th. The hurricane moved back over open water before making landfall for a second time at Little Egg Inlet in New Jersey on August 28th. This was the first time since 1903 that a hurricane made landfall in New Jersey. Rain fell for an 18-hour period, with totals ranging from six to eight inches across New Jersey. Higher amounts were observed in southwestern, central, and northeastern New Jersey. Irene brought tropical storm force winds, destructive storm surge, and record-breaking freshwater inland flooding across northeast New Jersey. There were thousands of mandatory and voluntary evacuations along the coast and rivers from surge and freshwater flooding, and widespread power outages that lasted for up to two weeks. Thirty-nine of the 94 USGS gages with greater than or equal to 20 years of record had record high peaks. Thirty-three gages experienced peaks equal to or greater than the 100-year recurrence interval. NWS climate site at Newark recorded 8.92 inches of rain. In Passaic County, rainfall totals ranged from 1.1 inches in the City of Clifton to 10.2 inches in the Township of Wayne. Damages in the County included downed trees in the Borough of Totowa, road closures throughout due to flooding, water entering homes near Hromiak Terrace and Dowling Parkway in the Borough of Woodland Park, and water of up to four feet in Hawthorne. One death occurred in Passaic County as a result of Irene. Immediately following the storm, the County had 6,000 displaced residents and three out of the four bridges that crossed the Passaic River were closed. Passaic County experienced the most significant damage from Irene and received the fourth highest amount of significant repetitive loss claims in the U.S. There were approximately 166 severely damaged homes and 39 severely damaged businesses as a result of Irene in the County.
October 29, 2011	Severe Storm (Snowstorm)	DR-4048	Yes	A historic and unprecedented early-season winter storm impacted the mid-Atlantic coast, bringing more than a foot of snow to the interior portions of northeast New Jersey. Thousands of people were without power. Snowfall totals in Passaic County ranged from 4.5 inches in the Borough of Hawthorne to 19 inches in the Township of West Milford. Rainfall totals ranged from 0.9 inches in the Township of Wayne to 1.62 inches in the Township of Little Falls.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
August 15, 2012	Severe Thunderstorms and Lightning	N/A	N/A	Strong to severe thunderstorms impacted Passaic County. Estimated wind gusts of 60 mph were reported for the County. In the Borough of Bloomingdale, a residential property was struck by lightning that resulted in a fire. Damage was reported on the second floor and the attic of the house, making it uninhabitable until repairs were made. In the Township of West Milford, multiple power lines were downed, which resulted in many power outages. Property damage was estimated at $8 million.
October 26 – November 8, 2012	Hurricane Sandy	DR-4048	Yes	Hurricane Sandy was the costliest natural disaster by far in the State of New Jersey. Record-breaking high tides and wave action combined with sustained winds as high as 60 to 70 mph with wind gusts as high as 80 to 90 mph to batter the State. Statewide, Sandy caused an estimated $29.4 billion in damage, destroyed or significantly damaged 30,000 homes and businesses, affected 42,000 additional structures, and was responsible directly or indirectly for 38 deaths. A new temporary inlet formed in Mantaloking (Ocean County) where some homes were swept away. About 2.4 million households in the State lost power. It would take two weeks for power to be fully restored to homes and businesses that were inhabitable. Also devastated by the storm was New Jersey's shellfish hatcheries including approximately $1 million of losses to buildings and equipment, and product losses in excess of $10,000 at one location alone. As storm surge from Sandy was pushed into the New York and Raritan Bays, sea water piled up within the Hudson River and coastal waterways and wetlands of northeastern New Jersey, including Newark Bay, Passaic and Hackensack Rivers, Kill van Kull, and Arthur Kill. Mandatory evacuations of people living along the coasts and rivers in Union, Essex, and Hudson Counties. Record breaking high tides and wave action was combined with sustained winds of 40 to 60 mph with gusts of 70 to 80 mph. Mandatory evacuations of people living along the coasts and rivers of Union, Essex, and Hudson Counties were conducted. Widespread power outages to more than one million people lasted up to two weeks. Overall, Sandy caused approximately $30 billion in damages in New Jersey and caused 12 deaths in the State. In Passaic County, wind gusts of 80 mph were recorded in Clifton. Rainfall totals ranged from 0.09 inches in the Borough of Hawthorne to 2.1 inches in Charlotteburg. Two fatalities in the County were a result from this event. It was reported that the County was without power for six days.
January 31, 2013	High Wind	N/A	N/A	High winds resulted in areas of damage and disruption to power. In Passaic County, a tree was knocked down onto a home in the City of Clifton. In the Township of West Milford, trees were knocked down and power was out due to high winds. Scattered power outages were reported throughout the area. Property damage was estimated at $110,000.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
October 7, 2013	Thunderstorm	N/A	N/A	Severe thunderstorms moved through northeast New Jersey, spawning a tornado in Bergen County. Wind gusts of up to 70 mph were reported in Passaic County. In Passaic County, a partial section of a roof was blown down in the Township of Wayne. A funnel cloud was spotted near the intersection of Trenton and Michigan Avenues in the City of Paterson. Property damage was estimated at $10,000.
April 29 – May 1, 2014	Heavy Rain	N/A	N/A	Very heavy rain caused poor drainage flooding, as well as minor to moderate flooding, in the Passaic River Basin. Rainfall totals in Passaic County ranged from three inches in the Borough of Ringwood to 4.32 inches in West Paterson (Borough of Woodland Park).
May 17, 2014	Heavy Rain	N/A	N/A	Rainfall totals in Passaic County ranged from 0.92 inches in the Township of Little Falls to 1.64 inches in the City of Paterson.
July 3, 2014	Thunderstorms and Flooding	N/A	N/A	In Passaic County, half-dollar to ping pong ball sized hail fell in Oak Ridge; trees were down in Hawthorne and Oakland, forcing road closures; and rainfall totals reached 2.58 inches in Ringwood.
July 14-15, 2014	Thunderstorms and Flash Flooding	N/A	N/A	In Passaic County, tree and wires were down on Gould Road in West Milford. In Paterson, River Street was closed due to flooding. Rainfall totals in the County reached 0.8 inches.

Source: NCDC 2014; ONJSC Rutgers University 2013; SPC 2014

FEMA Federal Emergency Management Agency

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

ONJSC Office of the New Jersey State Climatologist

E.2.8 Severe Winter Weather

Table E-8. Severe Winter Weather Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
January 6-7, 2009	Ice Storm	N/A	N/A	The combination of a weak high retreating over the Northeast and deepening low pressure over the Great Lakes resulted in a significant accumulation of ice across portions of northern New Jersey. In Passaic County, ice amounts averaged a little more than one-half inch across the western half of Passaic County. Overall, totals ranged from 0.10 inches in West Paterson to 0.8 inches in Awosting (Township of West Milford).
March 1-2, 2009	Winter Storm	N/A	N/A	Heavy snow fell across the tri-state area with rates of two to three inches an hour. Snowfall amounts across northeast New Jersey ranged from four to eight inches, with amounts as high as 13.5 inches. In Passaic County, snowfall totals from eight inches in Haskell (Borough of Wanaque) to 13.5 inches in West Milford Township.
February 25-27, 2010	Winter Storm	N/A	N/A	Heavy snow, heavy rain, coastal flooding and strong winds impacted the region. One to two feet of snow were common across the area. Snowfall totals in Passaic County ranged from 13.5 inches in the Borough of Hawthorne to 28 inches in the Township of West Milford.
December 26-27, 2010	Blizzard	N/A	N/A	A low pressure system brought bands of heavy snow, thunderstorms and very strong winds to the area. The storm was identified as a blizzard and brought a between 20 to 30 inches of snow across northeast New Jersey. Winds of 25 to 40 mph also impacted the area, with gusts in excess of 60 mph. A state of emergency was declared for New Jersey. All three major airports were closed during the height of the storm. NJ Transit busses and several PATH lines were also suspended. Approximately 8,000 people were without power during the storm. Snowfall totals in Passaic County ranged from 22 inches in the Township of West Milford to 25.5 inches in the City of Clifton.
January 11-12, 2011	Winter Storm	N/A	N/A	Northeast New Jersey received a heavy snowfall between January 11th and 12th. It started off as light snow and then turned over to very heavy snow. The storm had snowfall rates of three to four inches per hour and the final heavy snow totals of eight to 16 inches across the region. Snowfall totals in Passaic County ranged from six inches in Haskell (Borough of Wanaque) to 11 inches in the City of Clifton.
October 29, 2011	Severe Storm (Snowstorm)	DR-4048	Yes	A historic and unprecedented early-season winter storm impacted the mid-Atlantic coast, bringing more than a foot of snow to the interior portions of northeast New Jersey. Thousands of people were without power. Snowfall totals in Passaic County ranged from 4.5 inches in the Borough of Hawthorne to 19 inches in the Township of West Milford. Rainfall totals ranged from 0.9 inches in the Township of Wayne to 1.62 inches in the Township of Little Falls.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
November 7-8, 2012	Nor'Easter	N/A	N/A	A strong Nor'Easter caused high winds along the coast of New Jersey, heavy snow in east-central New Jersey, 10 foot waves along the ocean front and minor tidal flooding along the ocean front. This storm caused setbacks with restoration efforts caused by Hurricane Sandy. Snowfall totals averaged one to five inches in most of the State, with six to 12 inches in Middlesex, Monmouth, and Ocean Counties. The combination of heavy snow and wind brought down trees, poles and power lines. In Passaic County, snowfall totals ranged from three inches in Wayne to 4.5 inches in Clifton.
December 29, 2012	Winter Storm / Nor'Easter	N/A	N/A	A deep area of low pressure approached from the southeast and pass just south of Long Island. Snowfall totals in Passaic County ranged from two inches in Wayne to 4.5 inches in West Milford.
February 8-9, 2013	Blizzard	N/A	N/A	Heavy snow and gusty winds impacted northeast New Jersey. In Passaic County, snowfall totals ranged from 10 inches in Haskell (Borough of Wanaque) to 13.2 inches in the Township of West Milford.
January 21, 2014	Winter Storm	N/A	N/A	A heavy band of snow moved west to east across northeastern New Jersey. Snowfall rates of one to two inches per hours were observed, along with temperatures in the teens across the region. In Passaic County, snowfall totals ranged from 3.5 inches in the Township of West Milford to 12.5 inches in the City of Clifton.
February 13-14, 2014	Nor'Easter	N/A	N/A	A low pressure system developed along the northern Gulf Coast and moved near Cape Hatteras and Virginia. It then moved northeast, passing east of Long Island and into the Gulf of Maine. It brought heavy snow and ice to northeast New Jersey. In Passaic County, snowfall totals ranged from 13.3 inches in Bloomingdale to 16.3 inches in West Milford. In Woodland Park, 14 inches of snow was reported and most likely responsible for a roof collapse of an industrial building on Andrews Drive. Another roof collapse of a large retail structure was reported on Route 46. Between one and three inches of freezing rain accumulated in the County as well.

Source: NOAA-NCDC 2014; NWS 2014; FEMA 2014; SPC 2014

DR Disaster Declaration

FEMA Federal Emergency Management Agency

N/A Not Applicable

NCDC National Climatic Data Center

NOAA National Oceanic and Atmospheric Administration

NWS National Weather Service

SPC Storm Prediction Center

E.2.9 Wildfire

Table E-9. Wildfire Events in Passaic County, 2008 to 2014

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
April 9, 2012	Wildfire	N/A	N/A	A wildfire at the Norvin Green State Forest in the Borough of Bloomingdale was contained at nine acres. Hand crews had to hike in about ¾-mile in rough terrain to get to the fire.
July 18, 2013	Brush Fire	N/A	N/A	A large brush fire broke out in the Township of West Milford at a public works facility on Lycosky Road.

Source: NOAA-NCDC 2014; FEMA 2014; NJFFS 2014
FEMA Federal Emergency Management Agency
NCDC National Climatic Data Center
NOAA National Oceanic and Atmospheric Administration
ONJSC Office of the New Jersey State Climatologist

E.2.10 Hazardous Substances Events

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
October 30, 2008	Diesel Fuel Spill	N/A	N/A	Approximately 30 to 40 gallons of diesel fuel was discharged at a truck stop due to a mechanical failure on a tractor trailer. No damages or injuries were reported as a result of this incident.
August 5, 2009	Fuel Oil Spill	N/A	N/A	Passaic Street between Canal Street and Columbia Avenue was closed due a hydraulic oil spill.
December 14, 2009	Diesel Fuel Spill	N/A	N/A	There was a release of 200 gallons of diesel fuel from the saddle tanks of a diesel tanker into the Rainwood Brook when the tanker went off the road due to ice. The material was contained with a boom.
January 7, 2010	Chemical Spill	N/A	N/A	A nitric acid spill at a plastic plant on Dey Road in Wayne Township injured two and forced the evacuation of 20 employees.
February 4, 2010	Chemical Spill	N/A	N/A	A 55-gallon drum of a non-hazardous resin tipped over in a tractor trailer on Chestnut Street in the City of Clifton. There were no reported injuries or damages from this incident.
September 16, 2011	Chemical Spill	N/A	N/A	A tractor trailer was offloading ferric sulfate in Totowa and while completed the off-load, the material sprayed from the hose onto the wall of the building and the bay door. The released material totaled 10 gallons and impacted an area of the concrete driveway measuring approximately 25-feet by 25-feet, which consisted of a thin layer of material. The released material also impacted a nearby stormdrain, but it was contained inside the catch basin. Absorbents were used to clean up the material.
September 19, 2012	Chlorine Spill	N/A	N/A	Clifton Fire Department's HAZMAT unit was dispatched to the Jewish Family Service Children's Center on Scoles Avenue after 75 gallons of chlorine began leaking in a storage room near the olympic-sized pool. HAZMAT addressed the leak and firefighters evacuated 75 people from the building.
February 3, 2013	Fuel Oil Spill	N/A	N/A	Fuel oil from a home's heating system tank leaked 100 gallons of oil into a nearby brook in West Milford Township. The County HAZMAT unit responded.
July 17, 2013	Chemical Spill	N/A	N/A	A chemical spill at the Passaic Valley Water Commission treatment plant was reported during the morning of July 17th. There were 14 drums of hydrogen peroxide in a vaporized state that required cleanup by the County and local HAZMAT departments.
December 27, 2013	Oil Spill	N/A	N/A	An oil spill in the City of Clifton resulted in HAZMAT operations and the placement of check booms along Getty Avenue to prevent waste oil leaking from JC Auto.
December 6, 2014	Carbon Monoxide	n/A	N/A	Carbon monoxide killed two people and hospitalized 12 people in a recording studio in the City of Passaic. HAZMAT teams, fire departments, EMS and a gas company responded to the incident.

Source: FEMA 2014; NorthJersey.com 2014; North American Hazmat Situations and Deployments Map 2014; ERNS Database 2014

E.2.11 Disease Outbreak Events

Date(s) of Event	Disease Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
2008	Influenza	N/A	N/A	In 2008, there were 284 reported cases of influenza in Passaic County.
2008	Hepatitis C	N/A	N/A	In 2008, there were 391 reported cases of chronic Hepatitis C in Passaic County.
2008	Foodborne Illnesses	N/A	N/A	In 2008, there were 87 reported cases of salmonella and 42 cases of campylobacteriosis in Passaic County.
2008	Tick-Borne Diseases	N/A	N/A	In 2008, there were 218 reported cases of Lyme disease and two reported cases of Rocky Mountain spotted fever.
2009	Influenza	N/A	N/A	In 2009, there were 284 reported cases of influenza in Passaic County.
2009	Hepatitis C	N/A	N/A	In 2009, there were 171 reported cases of chronic Hepatitis C in Passaic County.
2009	Foodborne Illnesses	N/A	N/A	In 2009, there were 85 reported cases of salmonella and 65 cases of campylobacteriosis in Passaic County.
2009	Tick-Borne Diseases	N/A	N/A	In 2009, there were 253 reported cases of Lyme disease and four reported cases of Rocky Mountain spotted fever.
2010	Influenza	N/A	N/A	In 2010, there were 41 reported cases of influenza in Passaic County.
2010	Hepatitis C	N/A	N/A	In 2010, there were 278 reported cases of chronic Hepatitis C in Passaic County.
2010	Foodborne Illnesses	N/A	N/A	In 2010, there were 70 reported cases of salmonella and 79 cases of campylobacteriosis in Passaic County.
2010	Tick-Borne Diseases	N/A	N/A	In 2010, there were 177 reported cases of Lyme disease and three reported cases of Rocky Mountain spotted fever.
2010	Mosquito-Borne Disease	N/A	N/A	In 2010, there were three reported cases of WNV in Passaic County.
2011	Influenza	N/A	N/A	In 2011, there were 62 reported cases of influenza in Passaic County.
2011	Hepatitis C	N/A	N/A	In 2011, there were 327 reported cases of chronic Hepatitis C in Passaic County.
2011	Foodborne Illnesses	N/A	N/A	In 2011, there were 74 reported cases of salmonella and 92 cases of campylobacteriosis in Passaic County.
2011	Tick-Borne Diseases	N/A	N/A	In 2011, there were 173 reported cases of Lyme disease and two reported cases of Rocky Mountain spotted fever.

Date(s) of Event	Disease Type	FEMA Declaration Number (if applicable)	Passaic County Designated?	Description
2012	Influenza	N/A	N/A	In 2012, there were 62 reported cases of influenza in Passaic County.
2012	Hepatitis C	N/A	N/A	In 2012, there were 326 reported cases of chronic Hepatitis C in Passaic County.
2012	Foodborne Illnesses	N/A	N/A	In 2012, there were 94 reported cases of salmonella and 79 cases of campylobacteriosis in Passaic County.
2012	Tick-Borne Diseases	N/A	N/A	In 2012, there were 172 reported cases of Lyme disease and three reported cases of Rocky Mountain spotted fever.
2013	Hepatitis C	N/A	N/A	In 2013, there were 290 reported cases of chronic Hepatitis C in Passaic County.
2013	Influenza	N/A	N/A	In 2013, there were 184 reported cases of influenza in Passaic County.
2013	Foodborne Illnesses	N/A	N/A	In 2013, there were 72 reported cases of salmonella and 83 cases of campylobacteriosis in Passaic County.
2013	Tick-Borne Diseases	N/A	N/A	In 2013, there were180 reported cases of Lyme disease and three cases of Rocky Mountain spotted fever in Passaic County.
2013	Mosquito-Borne Disease	N/A	N/A	In 2013, there were four reported cases of WNV in Passaic County.
2014	Enterovirus	N/A	N/A	From mid-August to December, the United States experienced a nationwide outbreak of enterovirus D68. There were a total of 1,152 confirmed cases in 49 states. In New Jersey, there were 38 confirmed cases, with Passaic County having one confirmed case.
June – October 2014	Mosquito-Borne Disease	N/A	N/A	There were 21 confirmed cases of chikungunya in Passaic County.

Source: Passaic County 2014; FEMA 2014; New Jersey Department of Health 2014

APPENDIX F. MITIGATION STRATEGY SUPPLEMENT

This appendix summarizes additional activities and resources provided to plan participants to support the update of the mitigation strategy.

F.1 2015 GOALS AND OBJECTIVES REVIEW

County and municipal planning documents and recent policies changes were reviewed and discussed with the Planning Partnership to help inform the review and update of the mission statement, goals and objectives. Table F-1 summarizes the Steering Committee review and evaluation of the 2015 HMP goals and objectives. In summary, all goals were maintained; however, the objectives were enhanced to include protection of community lifelines, increase understanding and adaptation to climate change and encourage the use of green infrastructure to align with the County Master Plan and community priorities.

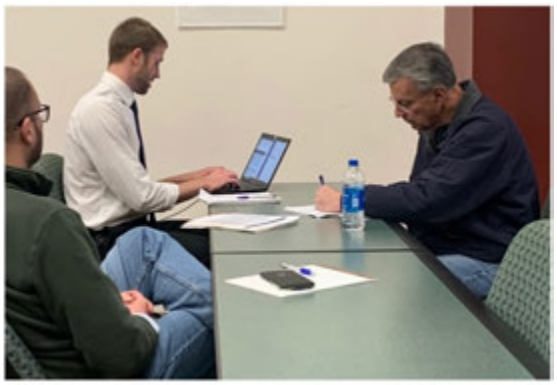
Figure F-1. Goal and Objective Evaluation

Goal	Goal Evaluation (Keep as is? Change? Add another goal?)	Objective	Objective Evaluation (Keep as is? Change? Add another objective?)
Goal 1: Protect life	Keep	1.1: Improve warning and emergency communications systems	Keep
		1.2: Reduce the impacts of hazards on people, property, and vulnerable populations	Keep
		1.3: Maintain and strengthen local regulatory standards including full and effective building code enforcement, floodplain management, and other vulnerability-reducing regulations	Keep
Goal 2: Protect property	Keep	2.1: Protect critical facilities	Protect and increase resilience of critical facilities and lifelines
		2.2: Reduce repetitive and severe repetitive losses	Keep
		2.3: Protect environmental resources that serve a natural hazard mitigation function	Keep
		2.4: Encourage cost-effective and environmentally-sound development and land use	Keep
		2.5: Facilitate development and timely submittal of project applications meeting state and federal guidelines for funding for repetitive and severe repetitive loss properties and hardening/retrofitting infrastructure and critical facilities with highest vulnerability rankings	Keep
		New	Encourage the use of green stormwater infrastructure
Goal 3: Increase public preparedness and awareness	Keep	3.1: Improve education and outreach efforts regarding risk, the potential impacts of hazards, and the identification of specific measures that can be taken to reduce their impact	Keep
		3.2: Improve data collection, use, and sharing to reduce the impacts of hazards	Keep

Goal	Goal Evaluation (Keep as is? Change? Add another goal?)	Objective	Objective Evaluation (Keep as is? Change? Add another objective?)
		3.3: Provide for user-friendly hazard data accessibility for mitigation and other planning efforts and for private citizens	Keep
Goal 4: Develop and maintain an understanding of risks from hazards	Keep	4.1: Acquire and maintain detailed critical facilities such that these sites can be prioritized and risk-assessed for possible mitigation actions	Acquire and maintain detailed critical facilities and lifelines such that these sites can be prioritized and risk-assessed for possible mitigation actions
		4.2: Improve hazard data available to the county and participating communities for use in future planning efforts	Keep
		4.3: Incorporate new state and FEMA guidance, rules, and regulations into the HMP	Keep
		New	Strengthen understanding of, and adaptation to, a changing climate
Goal 5: Enhance county and local mitigation capabilities to reduce hazard vulnerabilities	Keep	5.1: Increase local government official awareness regarding mitigation planning, project identification and funding opportunities for mitigation	Keep
		5.2: Provide government officials and local practitioners with educational opportunities and information regarding best practices for hazard mitigation planning, project identification, and implementation	Keep
		5.3: Improve capabilities, coordination, and opportunities at municipal and county levels to plan and implement hazard mitigation projects, programs, and activities	Keep
		5.4: Support increased participation in the National Flood Insurance Community Rating System	Keep
		5.5 Support increased integration of municipal/county hazard mitigation planning and floodplain management with effective municipal/county zoning regulation, subdivision regulation, and comprehensive planning implementation	Keep
Goal 6: Support continuity of operations pre-, during and post-hazard events	Keep	6.1: Ensure continuity of operations of essential county government services	Ensure continuity of operations of essential county and municipal government services
		6.2: Increase resiliency by facilitating rapid disaster recovery	Keep
		6.3: Support and encourage the implementation of alternative energy sources	Keep

F.2 MITIGATION STRATEGY WORKSHOP RESOURCES

On February 20, 2020 a Mitigation Strategy Workshop was held for all plan participants. The workshop consisted of an overview of the mitigation strategy update followed by a break-out of small groups. The small groups discussed common problem statements and vulnerabilities and assisted each other by identifying mitigation alternatives. Resources available at the workshop included the following to assist with the identification of mitigation alternatives and the development of the mitigation strategy workshops found in Section 9 (Jurisdictional Annexes).



1. FEMA Local Mitigation Handbook
2. Strengths, Weaknesses, Obstacles and Opportunities exercise results
3. Citizen survey results
4. FEMA Mitigation action types (Table F-2)
5. FEMA Mitigation Ideas
6. Mitigation Catalog for Passaic County (Table F-3)
7. FEMA Project Useful Life factsheet
8. Mitigation funding sources at the federal, state and local levels (Table F-4)

F.2.1 Types of Mitigation Actions

A mitigation action is a specific action, project, activity, or process taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals. The actions to reduce vulnerability to threats and hazards form the core of the plan and are a key outcome of the planning process.

The primary types of mitigation actions to reduce long-term vulnerability are:

- Local Plans and Regulations (LPR)
- Structure and Infrastructure Projects (SIP)
- Natural Systems Protection (NSP)
- Education and Awareness Programs (EAP)

Table F-1. FEMA Mitigation Action Types

Mitigation Type	Description	Examples
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	Comprehensive plans Land use ordinances Subdivision regulations Development review Building codes and enforcement NFIP Community Rating System Capital improvement programs Open space preservation Stormwater management regulations and master plans
Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private	Acquisitions and elevations of structures in flood prone areas Utility undergrounding Structural retrofits Floodwalls and retaining walls

Mitigation Type	Description	Examples
	structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.	Detention and retention structures Culverts Safe rooms
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	Sediment and erosion control Stream corridor restoration Forest management Conservation easements Wetland restoration and preservation
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	Radio or television spots Websites with maps and information Real estate disclosure Presentations to school groups or neighborhood organizations Mailings to residents in hazard-prone areas StormReady Firewise Communities

F.2.2 Mitigation Catalog

Table F-3 presents mitigation alternatives organized by hazard of concern at the personal, corporate and government scale.

DAM FAILURE		
Personal Scale	Corporate Scale	Government Scale
• ***Reduce exposure to the hazard***: o *No further development in failure inundation zone* • ***Reduce vulnerability to the hazard:*** o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability*** o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements.	• ***Manipulate the Hazard:*** o Increase freeboard • ***Reduce exposure to the hazard:*** o *No further development in failure inundation zone* • ***Reduce vulnerability to the hazard:*** o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability:*** o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements. o Ensure EAPs are kept in compliance with State regulations	• ***Manipulate the Hazard:*** o Increase freeboard • ***Reduce exposure to the hazard:*** o No further development in failure inundation zone • ***Reduce vulnerability to the hazard:*** o Structural flood control: levee's, dams, channelization, revetments. o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability:*** o More public outreach and education efforts o Conduct a watershed analysis for proposed dam or reservoir projects

DROUGHT		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Consider stored water/captured water techniques during dry seasons. • ***Reduce vulnerability to the hazard:*** o Drought resistant landscapes o Reduce water system losses o Regularly check for leaks to minimize water supply losses o Install low-flow water saving showerheads and toilets o Turn water flow off while brushing teeth or during other cleaning activities o Adjust sprinklers to water the lawn and not the sidewalk or street. o Run the dishwasher and washing machine only when they are full. o Check for leaks in plumping or dripping faucets. o Install rain-capturing devices for irrigation. o Install graywater systems in homes to encourage water reuse. • ***Increase Capability*** o Practice active water conservation techniques. o Seek ways to operate wells in such a way to enhance their functional longevity and supply capability.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Consider stored water/captured water techniques during dry seasons. • ***Reduce vulnerability to the hazard:*** o Drought resistant landscapes o Reduce private water system losses o Identify alternate water supply sources. o Install low-flow water saving showerheads and toilets o Adjust sprinklers to water the lawn and not the sidewalk or street. • ***Increase Capability:*** o Practice active water conservation o Develop a COOP o Create a water conservation plan.	• ***Manipulate the Hazard:*** o Groundwater recharge through stormwater management • ***Reduce exposure to the hazard:*** o Identify and create groundwater back up sources. o Create /identify new impounded water supply points. o Developing new or upgrading existing water delivery systems to eliminate breaks and leaks. • ***Reduce vulnerability to the hazard:*** o Water use conflict regulations o Reduce water system losses o Distribute water saving kits o Identify sites ideally suited for ground water recharge. o Implement stormwater retention in regions ideally suited for groundwater recharges. o Utilize drought resistant landscapes on community owned facilities. o Encourage citizens to take water-saving measures • ***Increase Capability:*** o Public education on drought resistance o Identify alternative water supplies for time of drought. Mutual aid agreements with alternative suppliers. o Develop a drought contingency plan o Develop criteria-"triggers" for drought related actions o Improve accuracy of water supply forecasts o Provide incentives to influence active water conservation techniques such as water user rate reductions.

DROUGHT		
		o Establish protocol for salt water de-salinization to be implemented during conditions of severe drought. o Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their homes. o Use of water buffalo tankers o Promote well usage techniques that strive to enhance functional longevity and supply capability of private water supply wells. o Develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc.

EARTHQUAKES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Locate outside of hazard area (off soft soils) • ***Reduce vulnerability to the hazard:*** o Retrofit structure (anchor house structure to foundation) o Secure household items that can cause injury or damage such as water heaters, bookcases, and other appliances o Build to higher design standards • ***Increase Capability*** o Practice "drop, cover and hold" o Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72 hr. self-sufficiency during an event o Increase capability by having cash reserves for reconstruction o Become informed on the hazard and risk reduction alternatives available. o Develop a post-disaster action plan for your household.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Locate/relocate mission critical functions outside hazard area where possible. • ***Reduce vulnerability to the hazard:*** o Build redundancy for critical functions/facilities o Retrofit critical buildings/areas housing mission critical functions. • ***Increase Capability:*** o Adopt higher standard for new construction -- Consider "performance-based design' when building new structures o Increase capability by having cash reserves for reconstruction o Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. o Develop a Continuity of Operations Plan (COOP)	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Locate critical facilities or functions outside of hazard area where possible. • ***Reduce vulnerability to the hazard:*** o Harden infrastructure o Provide redundancy for critical functions o Adopt higher regulatory standards for structures o Conduct "rapid screening" programs for critical facilities to identify facilities that may be particularly prone to EQ damage, then develop investigation/action plans to address such structures • ***Increase Capability:*** o Provide better hazard maps o Provide technical information and guidance o Enact tools to help manage development in hazard areas: tax incentives, information o Include retrofitting/replacement of critical system elements in CIP o Develop strategy to take advantage of post disaster opportunities o Warehouse critical infrastructure components such as pipe, power line, and road repair material. o Develop and adopt a Continuity of Operations / Continuity of Government Plan (COOP/COG) o Initiate triggers guiding improvements such as: (< 50% substantial damage/improvements)

EARTHQUAKES		
		o Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. o Develop a post disaster action plan that includes a grant funding and debris removal components. o Utilize warning systems o Educate builders and developers on seismic construction standards

EXTREME TEMPERATURES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Insulate structure o Provide redundant power. o Plant appropriate trees near home ("Right tree, right place" National Arbor Day Foundation Program). • ***Reduce vulnerability to the hazard:*** o Air condition non-conditioned buildings. o Install backup heat (e.g. wood burning stoves) o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability*** o Be aware of impending heat waves. o Inform yourself on the do's and don'ts during heat waves. o Have fans available for use during peak demands in leu of air conditioning. o Install back-up generators o Know the location of cooling and warming shelters	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create redundancy to power supply to deal with power grid vulnerability during high demands • ***Reduce vulnerability to the hazard:*** o Air condition non-conditioned buildings. o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability:*** o Inform employees of the seriousness of heat waves. o Monitor weather forecasts. o Establish a COOP.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create redundancy to power supply to deal with power grid vulnerability during high demands • ***Reduce vulnerability to the hazard:*** o Air condition public buildings. o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability:*** o Inform the public on the seriousness of heat-waves o Identify populations vulnerable to extreme heat (elderly, poor) for early warning during potential heat waves. o Enhance weather forecasting capability o Distribute fans to vulnerable populations. o Promote selective approaches to cooling your residences and businesses during peak demands.

FLOOD		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Clear stormwater drains and culverts • ***Reduce exposure to the hazard***: o Locate or re-locate outside of hazard area o Institute low impact development techniques on property • ***Reduce vulnerability to the hazard:*** o Retrofit existing structures and utilities above Base Flood Elevation (BFE) o Floodproof existing structures (wet- or dry floodproofing). o Store hazardous materials above BFE or outside of floodprone areas • ***Increase Capability*** o Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72-hr. self-sufficiency during and after an event o Buy flood insurance	• ***Manipulate the Hazard:*** o Clear stormwater drains and culverts • ***Reduce exposure to the hazard:*** o Locate business critical facilities or functions outside hazard area o Institute low impact development techniques on property • ***Reduce vulnerability to the hazard:*** o Build redundancy for critical functions/ retrofit critical buildings. o Provide flood-proofing measures when new critical infrastructure must be located in floodplains. o Harden structures and infrastructure (wet and dry-floodproofing) o Store hazardous materials above BFE or outside of floodprone areas • ***Increase Capability:*** o Increase capability by having cash reserves for reconstruction o Develop and adopt a Continuity of Operations Plan (COOP) o Solicit 'cost-sharing" through partnerships with private sector stakeholders on projects with multiple benefits. o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements. o Ensure that all dam EAP's are kept in compliance with State regulations	• ***Manipulate the Hazard:*** o Clear stormwater drains and culverts o Dredging, levee construction, providing retention areas… o Structural flood control: levee's, dams, channelization, revetments. o Construct regional stormwater control facilities o Lead and develop a county-wide stream clearing strategy including the development of thresholds for response/action. • ***Reduce exposure to the hazard:*** o Locate/re-locate critical facilities outside of hazard area o Acquire or relocate identified repetitive loss properties. o Promote open space uses in identified high hazard areas via techniques such as: PUD's, easements, setbacks, greenways, sensitive area tracks. o Adopt land development criteria such as PUD's, Density transfers, clustering o Institute low impact development techniques on property o Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff o Pass an ordinance to incorporate additional zoning classifications into flood zones within each municipality. o Increase floodplain standards within municipal. o Continue development application reviews by County Planning Board to reduce risky development practices. • ***Reduce vulnerability to the hazard:***

FLOOD		
		o Harden structures and infrastructure (wet and dry-floodproofing) o Provide redundancy for critical functions and infrastructure o Adopt appropriate regulatory standards such as cumulative substantial improvement/damage, freeboard, lower substantial damage threshold, compensatory storage. o Stormwater management regulations and master planning. o Adopt "no-adverse impact" floodplain management policies that strive to not increase the flood risk on down-stream communities. o Participate in the Community Rating System (CRS) o Implement as-built regulatory requirements o Implement site review ordinances/requirements o Establish stream maintenance programs with stakeholders o Incorporate retrofitting/replacement of critical facilities and infrastructure in Capital Improvement Plans (CIPs) o Promote the use of vegetation/plants as green erosion control measures to reduce localized flooding. • ***Increase Capability:*** o Produce better hazard maps, and improve access to flood hazard mapping o Capture/survey "high-water" marks during flood events. o Provide technical information and guidance on appropriate mitigation options available to businesses and homeowners

FLOOD		
		o Enact tools to help manage development in hazard areas (stronger controls, tax incentives, information) o Establish an additional layer of zoning within flood hazard areas o Develop strategy to take advantage of post disaster opportunities o Improve compliance with and enforcement of the NFIP o Develop mitigation partnerships with regional stakeholders o Join Community Rating System (CRS) program, or improve level of participation in CRS o Develop and implement a public information strategy for flood hazard awareness, flood insurance (NFIP) and mitigation o Maintain existing data as well as gather new data needed to define risks and vulnerability. o Create a building and elevation inventory of structures in the floodplain o Identify flood prone areas that may be in need of new flood studies o Establish a program to identify and educate owners of flood-prone properties of potential mitigation options (e.g. elevations, relocations) o Charge a hazard mitigation fee on all new permits to create a hazard mitigation funding source for initiatives or grant cost share requirements. o Integrate floodplain management policies into other planning mechanisms within the planning area. o Establish a Stormwater Utility to deal with urban drainage/flooding issues

FLOOD		
		o Establish incentives to promote flood hazard mitigation of private property (e.g. permit fee waivers). o Adopt ordinances/standards for cumulative damages and/or improvements o Upgrade NFIP Floodplain ordinance, as well as other ordinances to current or above current standards. o Develop and adopt a COOP o Join "Storm Ready" Program o Participate in county and regional training programs o Provide additional training/certification to NFIP floodplain administrators and code officials. o Implement annual training to account for high turnover of municipal officials. o Maintain and enhance flood forecasting ability, including the establishment and maintenance of critical stream gages o Promote awareness and participation in alert systems o Support and participate in regional flood management efforts, such as the Flood Mitigation Task Force or similar efforts o Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones. o Provide continued and enhanced training for emergency responders o Establish a revolving "bank" or budget line item to fund grant application support o Continue to review updated Flood Insurance Rate Maps to ensure accuracy as well as maintaining lines of communication with homeowners to make

FLOOD		
		them aware of potential changes related to their property status. o Provide trainings for FPA's on the NFIP/Floodplain Best Practices and also pursue CFM accreditation for municipal FPA's. o Build and maintain relationships to develop regional watershed/floodplain mitigation solutions. o Pursue grant funding opportunities to fund repairs of catchments and infrastructure on a proactive basis. o Explore grant funding opportunities related to climate change to fund mitigation projects.

GEOLOGIC HAZARD		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability*** o None	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability:*** o None	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Consider hazard areas in land-use planning, zoning and development siting o Acquire structures in highest hazard areas (demolish and convert to restricted open space) o Relocation of Structures o Open Space Preservation • ***Reduce vulnerability to the hazard:*** o Consider hazard areas in land-use planning and development siting o Stabilize vulnerable slopes near structures and infrastructure. o Work with stakeholders to develop appropriate risk reduction strategies. • ***Increase Capability:*** o Increase understanding of hazard areas (e.g. Landslide Susceptibility Maps) - geotechnical surveys, LIDAR and mapping o Work with stakeholders such as USGS, NJDEP to develop appropriate risk reduction strategies. o Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones o Develop county-level programs to document slide events (landslide inventory), and maintain its currency

SEVERE WEATHER		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o None • ***Reduce vulnerability to the hazard:*** o Retrofit structures (improved roofing, glazing, insulation, etc.) o Provide for redundant heat and power o Contact municipality or utilities to trim or remove trees that could affect power lines o Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program. • ***Increase Capability*** o Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio) o Promote 72-hour self-sufficiency o Provide for redundant heat and power o Participate in NOOA's SKYWARN training to increase knowledge and awareness of hazard	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Relocate critical infrastructure, such as power lines, underground o Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations. • ***Increase Capability:*** o Contact municipality or utilities to trim or remove trees that could affect power lines o Create redundancy (e.g. backup generators) o Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio) o Develop a Continuity of Operations Plan (COOP) o Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Harden infrastructure such as locating utilities underground. o Trimming trees back from power lines o Designate snow routes and strengthen critical road sections and bridges. o Adopt ordinances that regulate the type and quantity of trees planted near utility lines o Relocate critical infrastructure, such as power lines, underground • ***Increase Capability:*** o Support programs that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc. o Enforce building codes that require all roofs to withstand snow loads. o Increase communication alternatives o Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. o Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines o Promote awareness and participation in alert systems o Provide NOAA weather radios to the public o Create/Enhance "mutual aid" agreements for response to all emergencies o Create/identify evacuation routes to be utilized during severe storm events. o Develop debris management plans.

SEVERE WEATHER		
		o Join "Storm-Ready" program o Provide early warning of impending severe storm events to identified critical or essential facilities. This would include facilities such as large employments centers, schools, hospitals o Promote emergency power supplies to private property. o Improve, expand or harden communications facilities and services o Recruit additional emergency personnel or use mutual aid agreements o Increase sheltering capabilities o Increase capability to respond to power outages and downed power lines. Establish partnerships with utility providers through pro-active planning.

SEVERE WINTER STORMS		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation) • ***Reduce vulnerability to the hazard:*** o Insulate House to provide greater thermal efficiency and reduce heat loss. o Provide redundant heat and power o Insulate Structure o Ensure natural gas input/release valves do not get covered in snow • ***Increase Capability*** o Trim or remove trees that could affect power lines o Prepare emergency food and supplies to be self-sufficient for at least 72 hours in the event of a severe winter storm. o Be aware of inclement weather conditions and move your vehicles off of the street as severe weather systems approach. o Retrofit structures	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Relocate critical infrastructure, such as power lines, underground o Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations. o Install tree wire • ***Increase Capability:*** o Trim or remove trees that could affect power lines o Create redundancy in utilities and communications o Develop a Continuity of Operations Plan (COOP) to address operations before, during and after coastal storm events. o Utilize weather radios at the work place to keep your employees aware of severe weather conditions.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Harden infrastructure such as locating utilities underground where appropriate. o Trimming trees back from power lines o Designate snow routes and strengthen critical road sections and bridges. o Adopt codes and regulations that address the issues of parking of vehicles along roadways during severe weather events. o Develop or enhance the capacity/capability of stormwater conveyance systems. o Provide backup power sources at vital critical facilities. • ***Increase Capability:*** o Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc. o Establish and enforce building codes that require all roofs to withstand snow loads--Develop/Improve/Enforce building Codes in Hazard Areas o Increase communication alternatives o Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. o Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines o Provide weather radios to vulnerable populations

SEVERE WINTER STORMS		
		o Enhance public awareness campaigns to address those issues of alert and warning and actions to take during severe weather events. o Utilize the best available technology to enhance the warning systems for all severe weather events (i.e.: tornado warning systems). o Coordinate severe weather warning capabilities and the dissemination of warning amongst those agencies within the planning are with the highest degree of capability. o Encourage local ordinances for planting tree near lines and join Tree City USA. o Increase tree management programs. o Join the Community Rating System o Join "Storm-Ready" o Retrofit critical structures and promote hazard resistant construction o Keep open communications and education of hazards for mobile home communities o Retrofit above-ground utilities to underground facilities if appropriate o Create a salt reserve or research alternates to stretch salt reserve. o Ensure accessibility to hospital. o Provide better debris logistics and removal. o Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.

WILDFIRE		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Clear potential fuels on property; dry, overgrown underbrush; diseased trees • ***Reduce exposure to the hazard***: o Clean and maintain defensible space around structures o Locate outside hazard area o Mow regularly • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structures, provide water on site. o Use fire-retardant building materials o Create defensible spaces around your home. • ***Increase Capability*** o Employ Firewise techniques to safeguard your home o Identify alternative water supply points proximate to your home such as swimming pools, lakes, streams o Support your local fire department o Be aware of weather conditions that support/enhance the probability of wildfires	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** • • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structure and infrastructure and provide water onsite o Use fire-retardant building materials o Provide stored water to be utilized for fire fighting with appropriate fire department connections at facilities not equipped with fire hydrants or inadequate fire hydrant spacing • ***Increase Capability:*** o Support Firewise community initiatives	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Clear fuels (dry underbrush, diseased trees) on land that can trigger and maintain wildfires o Implement Best Management Practices on public lands • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structure and infrastructure o Higher regulatory standards o Establish water main supply and hydrants in unhydranted areas o Decrease hydrant spacing o Purchase • ***Increase Capability:*** o More public outreach and education efforts including an active “Firewise” program o Identify fire response and alternative evacuation routes o Seek alternative water supplies in urban wildland interface areas. o Become a "Firewise" community o Increase capability to fight wildfires utilizing equipment that can support wildfire fighting such as: tankers, engines with "pump-and-run" capabilities, dump tanks for tanker shuttle operations. o Develop/implement wildfire management plans. o Establish Mutual Aid Agreements with the Tender Task Force o Attend the Tender Apparatus Response Plan (TARP) training conducted by Kean University

HARMFUL ALGAL BLOOM		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Comply with harmful algal bloom rules and regulations to minimize the exposure to HAB. • ***Reduce vulnerability to the hazard:*** o Form citizen action groups to promote awareness and best practices on local levels. • ***Increase Capability*** o Regularly check County website for information	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Harmful Algal Bloom events throughout the county/region.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create/disseminate planting guides which explain Harmful Algal Bloom safety both recreationally and for drinking water purposes. o • ***Reduce vulnerability to the hazard:*** o Pass municipal ordinances to enforce best practices for invasive species at the local level. • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Harmful Algal Bloom throughout the county/region. o Work with federal/state agencies to disseminate information to local municipalities regarding Harmful Algal Bloom o Disseminate information to the general public to educate them on Harmful Algal Bloom o Work with stakeholders to identify and expand resources for prevention and early detection of Harmful Algal Bloom o Apply for funding to increase testing inlet/outlet o Highlands/Public/Private Partnership (Ringwood in Passaic County has been successful at obtaining grant funding and application is a model template)

INFESTATION/INVASIVE SPECIES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Participate in quarantine, control, or eradication programs. • ***Reduce exposure to the hazard***: o • ***Reduce vulnerability to the hazard:*** o Form citizen action groups to promote awareness and best practices on local levels. • ***Increase Capability*** o Become familiar with recognition and inspect your properties o Comply with Invasive Species rules and regulations to minimize the chance for invasive species to spread. o Broaden collaborations focused on ecosystem restoration and ecosystem-based management.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** • • ***Reduce vulnerability to the hazard:*** o • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region.	• ***Manipulate the Hazard:*** o Work with Federal/State agencies on quarantine, control, or eradication programs for invasive species. • ***Reduce exposure to the hazard:*** o Create/disseminate planting guides which explain which types of plants and vegetation are safe to plant within the county. • ***Reduce vulnerability to the hazard:*** o Pass municipal ordinances to enforce best practices for invasive species at the local level. • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region. o Work with federal/state agencies to disseminate information to local municipalities regarding Invasive Species o Disseminate information to the general public to educate them on Invasive Species o Work with stakeholders to identify and expand resources for prevention and early detection of invasive species. o Broaden collaborations focused on ecosystem restoration and ecosystem-based management.

F.1.1 Potential Mitigation Funding Sources

While it is important to recognize the mitigation strategies for each jurisdiction to help achieve the mitigation goals and objectives of the HMP, it is also important to provide sources for funding to implement these strategies. The table below provides a list of programs, descriptions, and links for those seeking funding sources. Please note that this table is not intended to be a comprehensive list, but rather a starting point to help identify potential sources of funding for the identified mitigation strategies.

Program	Description	Lead Agency	Website
Federal			
Hazard Mitigation Assistance (HMA)	Grants to provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages – includes FMA, HMGP, PDM	FEMA	https://www.fema.gov/hazard-mitigation-assistance
Flood Mitigation Assistance (FMA)	Grants to States, communities, tribes and territories for pre-disaster mitigation planning and projects to help reduce or eliminate the long-term risk of flood damage to structures insurable under the National Flood Insurance Program	FEMA	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program (HMGP)	Grants to States, communities, tribes and territories for planning and projects providing long-term hazard mitigation measures following a major disaster declaration	FEMA	https://www.fema.gov/hazard-mitigation-grant-program
Building Resilient Infrastructure and Communities (BRIC) Grant Program	Grants to States, communities, tribes and territories for reducing the risks they face from disasters and natural hazards. This is a new program (2020) with the following guiding principles: through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.	FEMA	https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
Public Assistance: Hazard Mitigation Funding Under Section 406	Hazard mitigation discretionary funding available under Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act following a Presidentially declared disaster	FEMA	https://www.fema.gov/news-release/2017/05/03/4309/fema-hazard-mitigation-grants-404-and-406

Program	Description	Lead Agency	Website
Assistance to Firefighters Grant Program	The primary goal of the Assistance to Firefighters Grants (AFG) is to enhance the safety of the public and firefighters with respect to fire-related hazards by providing direct financial assistance to eligible fire departments, nonaffiliated Emergency Medical Services organizations, and State Fire Training Academies. This funding is for critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience.	FEMA	https://www.fema.gov/welcome-assistance-firefighters-grant-program
High Hazard Potential Dams (HHPD) Rehabilitation Grant	The Rehabilitation of High Hazard Potential Dams Grant Program (HHPD provides technical, planning, design, and construction assistance in the form of grants to non-Federal governmental organizations or nonprofit organizations for rehabilitation of eligible high hazard potential dams.	FEMA	https://www.grants.gov/web/grants/view-opportunity.html?oppId=316238
Fire Management Assistance Grant Program	Assistance for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster. Provides a 75% Federal cost share and the State pay the remaining 25% for actual cost.	FEMA	https://www.fema.gov/fire-management-assistance-grant-program
Disaster Housing Program	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage and rental assistance	HUD	https://www.hud.gov/program_offices/public_indian_housing/publications/dhap
HOME Investment Partnerships Program	Grants to local and state government and consortia for permanent and transitional housing, (including financial support for property acquisition and rehabilitation for low income persons)	HUD	https://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/
HUD Disaster Recovery Assistance	Grants to fund gaps in available recovery assistance after disasters (including mitigation)	HUD	https://www.hud.gov/info/disasterresources
Section 108 Loan Guarantee	Enables states and local governments participating in the Community Development Block Grant (CDBG) program	HUD	https://www.hudexchange.info/programs/section-108/

Program	Description	Lead Agency	Website
	to obtain federally guaranteed loans for disaster-distressed areas		
Smart Growth Implementation Assistance (SGIA) program	The SGIA program focuses on complex or cutting-edge issues, such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under 4 categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design or medical and social service facilities siting.	EPA	https://www.epa.gov/smartgrowth
Partners for Fish and Wildlife	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats	U.S. Fish and Wildlife Service	https://www.fws.gov/partners/
FHWA Emergency Relief Program	Fund for the repair or reconstruction of Federal-aid highways that have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause	U.S. Department of Transportation (DOT)	https://www.fhwa.dot.gov/programadmin/erelief.cfm
Transportation Investment Generating Economic Recovery (TIGER)	Investing in critical road, rail, transit and port projects across the nation	U.S. DOT	https://www.transportation.gov/tags/tiger-grants
Community Facilities Direct Loan & Grant Program	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings.	USDA	https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program
Emergency Loan Program	USDA's Farm Service Agency (FSA) provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine	USDA	https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/index

Program	Description	Lead Agency	Website
Emergency Watershed Protection (EWP) program	Provide assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
Financial Assistance	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/
Emergency Management Performance Grants (EMPG) Program	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities	U.S. DHS	https://www.fema.gov/emergency-management-performance-grant-program
Reimbursement for Firefighting on Federal Property	Provides reimbursement only for direct costs and losses over and above normal operating costs.	U.S. DHS	https://www.usfa.fema.gov/grants/firefighting_federal_property.html
Department of Homeland Security Grant Program (HSGP)	HSGP is composed of three interconnected grant programs including the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Operation Stonegarden (OPSG). Together, these competitive grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration.	U.S. DHS	https://www.dhs.gov/homeland-security-grant-program-hsgp
Land & Water Conservation Fund	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies)	National Park Service	https://www.nps.gov/subjects/lwcf/index.htm
Land and Water Conservation Fund	Funding to states, local and conservation organizations for outdoor recreational development, renovation, land acquisition, and planning.	U.S. Department of the Interior	https://www.doi.gov/lwcf
USSBA	Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes,	Small Business	https://www.sba.gov/funding-programs/disaster-assistance

Program	Description	Lead Agency	Website
	and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.	Administration (SBA)	
State			
Environmental Infrastructure Financing Program	Qualified borrowers receive loans in two equal parts: Approximately one half to three quarters comes from a 0-interest State Revolving Fund maintained by the NJDEP. The other portion comes from proceeds of highly rated tax-exempt revenue bonds sold by the Trust. Combining these two funds results in a loan that is 50 to 75% lower than traditional loan rates.	NJDEP	
Meadowlands Infrastructure Trust Fund	Grants are available for stormwater management, updating GIS systems, affordable housing planning, and solid waste disposal for the counties and municipalities that are under this Commission.	NJ Sports and Exposition Authority	
New Jersey Green Acres Program	It is financed with Garden State Preservation Trust funds through three partnering agencies: The Green Acres Program, a division of the Department of Environmental Protection to preserve natural lands and recreational parks. The Farmland Preservation Program is administered by the independent State Agriculture Development Committee to acquire the development rights on privately owned farmland. Historic Preservation Program is administered by the independent New Jersey Historic Trust to provide matching grants to save important historic buildings.	NJDEP	https://www.nj.gov/dep/greenacres/
New Jersey Small Cities Communities Development Block Grants	Provide funds for economic development, housing rehabilitation, community revitalization, and public facilities designated to benefit people with low and moderate incomes, or to address recent local needs for which no other source of funding	NJDCA	https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html

Program	Description	Lead Agency	Website
	is available to non-entitlement counties and municipalities.		
New Jersey Conservation Foundation (NJCF)	NJCF is a private, not-for-profit organization. Through acquisition and stewardship, NJCF protects strategic lands, promotes strong land use policies, and forges partnerships to achieve conservation goals. Grants to help fund preservation activities.	NJCF	https://www.njconservation.org/what-we-do/
The New Jersey Infrastructure Bank	Two programs provide and administer low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Approximately $350 million is awarded annually. 1. New Jersey Environmental Infrastructure Trust (NJEIT) for the purpose of financing water quality infrastructure projects that enhance ground and surface water resources, ensure the safety of drinking water supplies, protect the public health and make possible responsible and sustainable economic development. 2. The New Jersey Transportation Infrastructure Bank (NJTIB) is an independent State Financing Authority responsible for providing and administering low interest rate loans to qualified municipalities, counties, and regional authorities in New Jersey for the purpose of financing transportation quality infrastructure projects.	NJDEP	https://www.njib.gov/
Drinking Water State Revolving Fund (DWSRF)	The DWSRF program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Infrastructure Trust funds. Additionally, the Water Supply program provides operator licensing and training support as well as financial assistance through the DWSRF program.	NJDEP	https://www.state.nj.us/dep/watersupply/dws_loans.html
New Jersey Water Bank	New Jersey Water Bank - NJWB (formerly New Jersey Environmental Infrastructure Financing Program - NJEIFP) is a partnership between the New Jersey	NJDEP	https://www.nj.gov/dep/dwq/mface_njeifp.htm

Program	Description	Lead Agency	Website
	Department of Environmental Protection (NJDEP) and the New Jersey Environmental Infrastructure Trust (Trust) to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water.		
NJ Highlands	Highlands Regional Master Plan (RMP) grant funding for forest resource and stream corridor protection and management planning includes the identification of restoration, mitigation, and stewardship programming needs and mechanisms.	The New Jersey Highlands	https://www.highlands.state.nj.us/njhighlands/grantprograms/
New Jersey Department of Transportation (NJDOT)	Funding of the Program is typically federal through the Federal Highway Administration or State through the Transportation Trust Fund.	NJDOT	https://www.state.nj.us/transportation/business/localaid/funding.shtm
New Jersey Department of Transportation – Local Aid Program	Annually, local aid programs provide approximately $400 million in a combination of federal and state transportation trust fund funding. The Transportation Trust Fund for FY 2017 thru 2024 alone provides $310 million in state aid to municipalities and counties for local transportation improvements.	NJDOT	https://www.state.nj.us/transportation/business/localaid/funding.shtm

APPENDIX G. PLAN MAINTENANCE TOOLS

This appendix includes tools and worksheets to facilitate plan maintenance and review by the Passaic County Steering and Planning Committees.

In the first year of the performance period, an online performance progress reporting system, the BATool[SM] will provide municipal and county representatives direct access to their mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, add or delete projects to maintain mitigation project implementation. This online program will capture information and roll all input into a report to summarize mitigation strategy progress.

The FEMA 386-4 guidance worksheets are also available to assist with progress reporting. These worksheets are provided below for ease of access to the HMP Coordinator and Planning Partnership to maintain the 2020 HMP throughout its period of performance.

Worksheet #1 Progress Report step 2

Progress Report Period: _____ to _____
(date) (date)

Project Title: _____ Project ID#: _____

Responsible Agency: _____

Address: _____

City/County: _____

Contact Person: _____ Title: _____

Phone #(s): _____ email address: _____

List Supporting Agencies and Contacts:

_____

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

_____

_____

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):

Project Status

☐ Project on schedule

☐ Project completed

☐ Project delayed*

*explain: _____

_____

☐ Project canceled

Project Cost Status

☐ Cost unchanged

☐ Cost overrun*

*explain: _____

_____

☐ Cost underrun*

*explain: _____

_____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

_____

_____

_____

_____

B. What obstacles, problems, or delays did you encounter, if any?

_____

_____

_____

C. How was each problem resolved?

_____

_____

_____

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other comments:

Worksheet #2 Evaluate Your Planning Team step 3

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team?		
Comments/Proposed Action:		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?		
Comments/Proposed Action:		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?		
Comments/Proposed Action:		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently?		
Comments/Proposed Action:		
Are there ways to gain more diverse and widespread cooperation?		
Comments/Proposed Action:		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?		
Comments/Proposed Action:		

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3 Evaluate Your Project Results step 3

Project Name and Number: _____

_____

Project Budget: _____

_____

Project Description: _____

_____

_____

Associated Goal and Objective(s): _____

_____

_____

Indicator of Success (e.g., losses avoided): _____

_____

_____

Insert location map.

Include before and after photos if appropriate.

Was the action implemented? ☐ **YES** ☐ **NO**

IF NO

Why not?	**YES**	**NO**
Was there political support for the action?	☐	☐
Were enough funds available?	☐	☐
Were workloads equitably or realistically distributed?	☐	☐
Was new information discovered about the risks or community that made implementation difficult or no longer sensible?	☐	☐
Was the estimated time of implementation reasonable?	☐	☐
Were sufficient resources (for example staff and technical assistance) available?	☐	☐

IF YES

What were the results of the implemented action? _____

_____

_____

_____

_____

_____

_____

	YES	NO
Were the outcomes as expected? If No, please explain:		
Did the results achieve the goal and objective(s)? Explain how:		
Was the action cost-effective? Explain how or how not:		
What were the losses avoided after having completed the project?		
If it was a structural project, how did it change the hazard profile?		
Additional comments or other outcomes:		

Date: _____

Prepared by: _____

Worksheet #4 Revisit Your Risk Assessment step 4

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Is future land development accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly.

Worksheet #1 Progress Report step 2

Progress Report Period: October 1, 2003 (date) to December 31, 2003 (date)

Project Title: Raging River Views Park Flood Acquisition Project Project ID#: HVMP-2003-01

Responsible Agency: Hazardville Department of Planning

Address: 1909 Burnham Way

City/County: Hazardville, Emergency

Contact Person: Eunice Euclid Title: Grants Administrator

Phone #(s): (555) 555-8473 email address: eeuclid@town.hazardville.en

List Supporting Agencies and Contacts:

Hazardville Department of Housing: Noah Hudson (555) 555-8465

Hazardville Habitat for Humanity: Carter Goodman (555) 555-9432

Total Project Cost: $360,000

Anticipated Cost Overrun/Underrun: $N/A

Date of Project Approval: July 21, 2003 Start date of the project: November 15, 2003

Anticipated completion date: Summer 2005

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase):

Acquire and demolish 14 structures located at the Raging River Views Park. Work with Habitat for Humanity and the Department of Housing to construct new housing or rehabilitate existing housing for displaced low-income residents. The Department of Housing will also provide funds for temporary housing to displaced residents.

Milestones	Complete	Projected Date of Completion
Conduct surveys of ground and first-floor elevations	✓	
Obtain Notices of Intent by owners	✓	
Conduct structure appraisals	✓	
Send letters of offer to homeowners		1/31/04
Perform title work		3/30/04
Acquire structures		6/30/04
Begin construction of new housing or reconstruction of existing housing for relocated residents		6/30/04
Send payment for relocation to renters		9/30/04
Finalize contract for demolition		1/12/05
Demolish structures		4/26/05
Landscape open parcels		6/30/05

Plan Goal(s)/Objective(s) Addressed:

Goal: Minimize losses to existing and future structures within hazard areas.

Objective: Reduce potential damages to the manufactured home park in the floodplain.

Indicator of Success (e.g., losses avoided as a result of the acquisition program):

In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

Losses Avoided. After a major flood (100-year), the Department of Economic Development will assist the Planning Department in calculating the losses avoided.

Status (Please check pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):

Project Status

- [x] Project on schedule
- [ ] Project completed
- [ ] Project delayed*

*explain:

- [ ] Project canceled

Project Cost Status

- [x] Cost unchanged
- [ ] Cost overrun*

*explain:

- [ ] Cost underrun*

*explain:

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

The Department of Planning contacted the owners of the properties vulnerable to floods to determine their willingness to sell their properties. Of the 14 property owners contacted, 10 agreed to have their homes acquired. An appraiser contracted by the Department of Planning estimated the value of the 10 properties.

B. What obstacles, problems, or delays did you encounter, if any?

The owners of four properties refused to sell. There has been some limited neighborhood opposition to various suggestions for the community open space created by the acquisitions.

C. How was each problem resolved?

The Department of Planning has proposed to the residents a design charrette to develop alternatives for the open space that would be created, with the understanding that no permanent structures can be constructed on the open parcels after acquisition and demolition has been completed. Recreational activities will be limited to passive uses such as trails and bike paths.

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

1. Send offer letters to homeowners.
2. Do title work.
3. Work with the Department of Housing and Habitat for Humanity to identify existing housing for rehabilitation and viable vacant parcels to construct new housing for the displaced residents.

Other comments:

None

Adapted from the North Carolina HMGP Progress Report Form at http://www.dem.dcc.state.nc.us/mitigation/document_index.htm.

Worksheet #2 Evaluate Your Planning Team step 3

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team?		✓
Comments/Proposed Action: NA		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?	✓	
Comments/Proposed Action: Hazardville Habitat for Humanity has been invaluable to assisting the relocation of former Raging River Views Park residents. The organization should be invited to participate in THORR.		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?	✓	
Comments/Proposed Action: It is essential that the Department of Public Works be represented at each meeting because so many mitigation actions involve them. However, representatives from the department have been unable to attend meetings consistently since the development of the plan. THORR will work with the departments director to find consistent, active representation.		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently?	✓	
Comments/Proposed Action: Again, the Department of Public Works has been unable to provide timely progress reports of its mitigation actions. Administrative duties and paperwork have fallen through the cracks since the department has been assigned numerous new duties to Hazardville's mitigation efforts. Perhaps the department, in partnership with THORR, should approach the Town Council for funding for more department staff.		
Are there ways to gain more diverse and widespread cooperation?	✓	
Comments/Proposed Action: THORR members believe that better publicity about mitigation actions will garner more interest from the public, affected/interested organizations, and state agencies.		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?	✓	
Comments/Proposed Action: THORR has learned about new PDM funding. The state has asked that local jurisdictions submit applications for brick and mortar projects and risk assessments studies.		

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3 Evaluate Your Project Results step 3

Project Name and Number:

Raging River Views Park Flood Acquisition Project (HVMP-2003-01)

Project Budget:

$360,000

Project Description:

Acquisition and demolition of 14 flood-prone structures

Associated Goal and Objective(s):

Goal: Minimize losses to existing and future structures within hazard areas

Objective: Reduce potential damages to the manufactured home park in the floodplain

Indicator of Success (e.g., losses avoided):

Losses avoided by acquisition and demolition of flood-prone structures

Town of Hazardville Composite Loss Map developed previously during risk assessment (see FEMA 386-2).

Was the action implemented? ☑ YES ☐ NO

IF NO

Why not?	YES	NO
Was there political support for the action?	☐	☐
Were enough funds available?	☐	☐
Were workloads equitably or realistically distributed?	☐	☐
Was new information discovered about the risks or community that made implementation difficult or no longer sensible?	☐	☐
Was the estimated time of implementation reasonable?	☐	☐
Were sufficient resources (for example staff and technical assistance) available?	☐	☐

IF YES

What were the results of the implemented action?

Of the 14 proposed properties, 10 were acquired. The benefit-cost ratio is 2.19, based on project benefits of $789,000 and costs of $360,274. Benefits are based on the net present value of the avoided damages over the project life. Furthermore, about 40 people are no longer in the path of a potential flood, making emergency rescue operations in that area less likely and evacuation easier.

	YES	NO
Were the outcomes as expected? If No, please explain:		✓
The project originally set out to acquire 14 properties. Four of the 14 owners did not want to participate in the buyout program.		
Did the results achieve the goal and objective(s)? Explain how:	✓	
Despite four properties still in harm's way, the objective has been largely met. See additional comments.		
Was the action cost-effective? Explain how or how not:	✓	
The FEMA Limited Data module was used to perform the benefit-cost analysis. Data for the analysis was collected from historical flood data and used as benchmarks in the before mitigation section of the analysis. The damages after mitigation section was left blank, due to the properties being permanently acquired, and the economic risk removed completely. The analysis resulted in a benefit-cost ratio of 2.19, with benefits totaling $789,000 for 10 properties.		
What were the losses avoided after having completed the project?		
Total avoided losses are $789,000 over the lifetime of the project (estimated at 100 years).		
If it was a structural project, how did it change the hazard profile?		
N/A		
Additional comments or other outcomes:		
The Planning Department has agreed to work with the remaining four homeowners in evaluating other flood-proofing options.		

Date: October 12, 2005

Prepared by: Hazardville Department of Economic Development
Hazardville Department of Planning

Worksheet #4 Revisit Your Risk Assessment step 4

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?		✓	
Profile hazard events	Are new historical records available?		✓	
	Are additional maps or new hazard studies available?	✓		Recently completed maps and studies showing vulnerability of the new coastal development to erosion and tidal surge are available.
	Have chances of future events (along with their magnitude, extent, etc.) changed?		✓	
	Have recent and future development in the community been checked for their effect on hazard areas?	✓		
Inventory assets	Have inventories of existing structures in hazard areas been updated?	✓		
	Is future land development accounted for in the inventories?	✓		The Planning Department is preparing a coastal development plan to ensure that any future development is set back far enough to be outside the erosion zones and the coastal high hazard areas. Current and future road configurations will also be studied to ensure adequate evacuation times before hurricane events.
	Are there any new special high-risk populations?	✓		Coastal residents and business owners.
Estimate losses	Have loss estimates been updated to account for recent changes?	✓		

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly.

APPENDIX H. LINKAGE PROCEDURES

This appendix contains the linkage procedures for the Passaic County Hazard Mitigation Plan.

H.1 ADMINISTRATIVE PROCESS FOR "LINKAGE" TO THE PASSAIC COUNTY HAZARD MITIGATION PLAN

Even though that initial development of the Passaic County Hazard Mitigation Plan (HMP or plan) included all municipalities in the County, not all eligible local governments within the defined planning area are included in this plan. Completed jurisdictional annexes are presented in Section 9. Any non-participating local governments and other local jurisdictions such as Fire Districts, Utility Districts, School Districts and any other eligible local government as defined in 44 CFR 201.2 within the Passaic County planning area can join this plan as a participating jurisdiction and to ultimately achieve approved status by following the linkage procedures defined in this appendix.

It is assumed that some or all of these non-participating local governments may choose to "link" to the plan at some point in time to gain eligibility for programs under the Disaster Mitigation Act (DMA). In addition, some of the current partnership may not continue to meet eligibility requirements due to the lack of active participation as prescribed by the plan. These "linkage" procedures will define the requirements established by the Passaic County HMP Steering Committee and all planning partners for dealing with the increase or decrease in planning partners linked to this plan. It should be noted that currently non-participating jurisdictions within the defined planning area are not obligated to link to this plan. These jurisdictions can choose to do their own "complete" plan that addresses all required elements of section 201.6 of 44CFR.

H.1.1 Increasing the Partnership Through Linkage

Eligibility

Eligible jurisdictions located in the planning area may link to this plan at any point during the plan's performance period. Eligible jurisdictions located in the planning area may link to this plan at any point during the plan's performance period (5 years after final approval). Eligibility will be determined by the following factors:

- The linking jurisdiction is a local government as defined by the DMA.
- The boundaries or service area of the linking jurisdiction is completely contained within the boundaries of the planning area established during the 2020 hazard mitigation plan development process.
- The linking jurisdiction's critical facilities and lifelines were included in the critical facility, lifeline and infrastructure risk assessment completed during the 2020 plan development process.

Requirements

It is expected that linking jurisdictions will complete the requirements outlined below and submit their completed template to the Hazard Mitigation Planning Coordinator - Passaic County Office of Emergency Management - for review within six months of beginning the linkage process:

1. The Passaic County HMP Steering Committee has established an annual window for which linkage to the plan can occur. Linking jurisdictions are instructed to complete the following procedures during this time frame.

2. The current non-participating jurisdiction contacts the Passaic County Hazard Mitigation Planning Coordinator for the plan and requests a "Linkage Package". The Passaic County Hazard Mitigation Planning Coordinator is:

   Robert A. Lyons, OEM Coordinator
   300 Oldham Road
   Wayne, New Jersey 07470
   pcoem@passaiccountynj.org

3. The Passaic County Hazard Mitigation Planning Coordinator will provide a linkage packages that includes:

   - Copy of Volume 1 and 2 of the plan (thumb drive).
   - Planning Partner's Expectations Sheet.
   - A Sample "Letter of Intent" to Link to the HMP.
   - A Jurisdictional Template and Instructions.
   - Catalog of Hazard Mitigation Alternatives or the Mitigation Catalog.
   - A copy of Section 201.6 of Chapter 44, the Code of Federal Regulations (44CFR), which defines the federal requirements for a local hazard mitigation plan.

4. The new jurisdiction will be required to review both volumes of the plan which includes the following key components for the planning area:

   - The Passaic County risk assessment;
   - The plan's goals and objectives;
   - Plan implementation and maintenance procedures;
   - Catalog of potential mitigation actions; and
   - County-wide initiatives.

   Once this review is complete, the jurisdiction will complete its specific jurisdictional annex by following the template and its instructions for completion provided by the Passaic County Hazard Mitigation Planning Coordinator. Technical assistance can be provided upon request by completing the request for technical assistance (TA) form provided in the linkage package. This TA may be provided by the Passaic County Hazard Mitigation Planning Coordinator or any other resource within the Planning Partnership such as a member of the HMP Steering Committee, Planning Committee or a currently participating jurisdiction. The Passaic County Hazard Mitigation Planning Coordinator will determine who will provide the TA and the possible level of TA based on resources available at the time of the request.

5. The new jurisdiction will also be required to develop a public involvement strategy that ensures their public's ability to participate in the plan development process. At a minimum, the new jurisdiction must make an attempt to solicit public opinion on hazard mitigation at the onset of this linkage process and a minimum of one public meeting to present their draft jurisdiction specific annex for comment, prior to adoption by the governing body. The Planning Partnership will have available resources to aid in the public involvement strategy such as the HMP website. However, it will be the new jurisdiction's responsibility to implement and document this strategy for incorporation into their annex.

   It should be noted that the Jurisdictional Annex templates do not include a section for the description of the public process. This is because the original partnership was covered under a uniform public involvement strategy that covered the operational area that is described in volume 1 of the plan. Since the new partner

was not addressed by that strategy, they will have to initiate a new strategy, and add a description of that strategy to their annex. For consistency, new partners are encouraged to follow the public involvement format utilized by the initial planning effort as described in Volume 1 of the plan.

6. Once their public involvement strategy is completed and they have completed their template, the new jurisdiction will submit the completed package to the Passaic County Hazard Mitigation Planning Coordinator for a pre-adoption review to ensure conformance with the Regional plan format.

7. The Passaic County Hazard Mitigation Planning Coordinator will review for the following:

   - Documentation of public involvement and mitigation action development strategies;
   - Conformance of template entries with guidelines outlined in instructions;
   - Chosen actions are consistent with goals, objectives, and mitigation catalog of Passaic County Hazard Mitigation Plan; and
   - Designated point of contact.

   The Passaic County Hazard Mitigation Planning Coordinator may utilize members of the HMP Planning Committee or other resources to complete this review. All proposed linked annexes will be submitted to the HMP Planning Committee for their review and comment prior to submittal to the New Jersey Office of Emergency Management – Mitigation Unit (NJOEM).

8. Plans approved and accepted by the HMP Planning Committee will then be forwarded to NJOEM for review with cover letter stating the forwarded plan meets local approved plan standards and whether the plan is submitted with local adoption or for criteria met/plan not adopted review.

9. NJOEM will review plans for state and federal compliance. Non-compliant plans are returned to the jurisdiction for correction. Compliant plans are forwarded to FEMA Region II office for review with annotation as to the adoption status.

10. FEMA Region II reviews the new jurisdiction's plan in association with the approved plan to ensure DMA compliance. Region II notifies new jurisdiction of results of review with copies to NJOEM and approved planning authority.

11. New jurisdiction corrects plan’s shortfalls (if necessary) and resubmits to NJOEM through the approved plan lead agency.

12. For plans with no shortfalls that have not been adopted from the Region II review or outstanding corrected shortfalls, the new jurisdiction governing authority adopts the plan (if not already accomplished) and forwards adoption resolution to Region II with copies to lead agency and NJOEM.

13. Region II Director notifies new jurisdiction governing authority of plan approval.

The new jurisdiction plan is then included with Passaic County HMP and the linking jurisdiction is committed to participate in the ongoing plan implementation and maintenance identified in Volume 1 of the HMP.