

Volume II



County of Essex All Hazard Mitigation Plan 2020 Update



Prepared for:

Essex County Sheriff's Office
Essex County Office of Emergency Management
Sheriff Armando B. Fontoura, Sheriff

Prepared by:



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Essex County
All Hazard Mitigation Plan Update

Volume II

FEBRUARY 2020

Prepared for:

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Sheriff Armand B. Fontoura, OEM Coordinator



Prepared by:



TETRA TECH

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Project 103S6483



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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 statement is 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 Essex 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 Essex 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

Essex 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 Essex County HMP update (Appendix B). Essex 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 July 18, 2019 (see Appendix C [Meeting Documentation] for details):

- Complete administrative tasks:
 - Complete a letter of intent to participate and return to the Essex County Sheriff's Office
 - 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 July 18, 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 September 2019 risk assessment meeting and October 2019 mitigation strategy workshop for review and update.

Hazard Ranking Exercise

The presentation of the risk assessment and hazard ranking for each jurisdiction was conducted on September 19, 2019. 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.

Exhibit 8-1. Participants Working at the Risk Assessment Meeting



Strengths Weaknesses Obstacles and Opportunities (SWOO) Exercise

After the draft risk assessment results were presented and hazard ranking exercise conducted, attendees at the September 19, 2019 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 October 2019. 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 October 24, 2019, 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. The nearly 100% participation of the planning partners reflects the excellent outreach and dedication of the planning team.

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.

Information gathered from the stakeholder focus-group sessions in November 2019 were later shared with the Planning Partnership to further inform the updated mitigation strategy development. This information was discussed via email and/or individual municipal/County meetings (in-person or via conference call).

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:

- 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 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 loss 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 Essex 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 Signature Pages

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 Essex County Sheriff’s mitigation website. To demonstrate broad and comprehensive review and input, each jurisdiction collected signatures from these representatives. Refer to Appendix B (Participation Documentation) to review the annex signature pages.

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 Matrix) and Appendix C (Meeting Documentation) for details on participation and meeting attendance.

Table 8-1. Jurisdictional Status

Municipality	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)
Essex County	NA	X	X	X	Yes
Township of Belleville	X	X	X	X	Yes
Township of Bloomfield	X	X	X	X	Yes
Borough of Caldwell	X	X	X	X	Yes
Township of Cedar Grove	X	X	X	X	Yes
City of East Orange	X	X	X	X	Yes
Borough of Essex Fells	X	X	X	X	Yes



Municipality	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)
Township of Fairfield	X	X	X	X	Yes
Borough of Glen Ridge	X	X	X	X	Yes
Township of Irvington	X	X	X	X	Yes
Township of Livingston	X	X	X	X	Yes
Township of Maplewood	X	X	X	X	Yes
Township of Millburn	X	X	X	X	Yes
Township of Montclair	X	X	X	X	Yes
City of Newark	X	X	X	X	Yes
Borough of North Caldwell	X	X	X	X	Yes
Township of Nutley	X	X	X	X	Yes
City of Orange Township	X	X	X	X	Yes
Borough of Roseland	X	X	X	X	Yes
Township of South Orange Village	X	X	X	X	Yes
Township of Verona	X	X	X	X	Yes
Township of West Caldwell	X	X	X	X	Yes
Township of West Orange	X	X	X	X	Yes

NA = Not applicable. The Essex County's Sheriff's Office 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 Essex 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.

Essex 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. The approval of their annex is presented on the sign-off sheets located in Appendix B (Participation Documentation). Each jurisdiction’s annex itself may be found in Sections 9.1 through 9.23.



ESSEX COUNTY

COUNTY AT A GLANCE

Total Population: **800,401**
 Total Land Area: **129.7 sq mi**
 Total # Buildings: **162,388**



1% Annual Chance Flood



32,128

Population Residing
in Floodplain



2,232

Persons That
May Seek Shelter*



\$69 Million

Potential Building Damages

*Countywide total estimate



\$2.1 Billion

Potential
Building Damages*

*Countywide total estimates



4

County-Owned
Critical Facilities

NFIP Statistics*



4,221 # NFIP
Policies

450 # RL NFIP
Properties

62 # SRL NFIP
Properties

*Countywide total estimates

Hurricane Storm Surge: Category 1



14,885

Population Located
in Category 1 SLOSH*



2,192

Buildings Located
in Category 1 SLOSH*

*Countywide total estimates

Mitigation Action Plan (2020-2025)



Hazards

All Natural and Non-
Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Emergency
Services, Structural Projects



9.1 ESSEX COUNTY

This section presents the jurisdictional annex for Essex County. The annex includes a general overview of the County; an assessment of Essex 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 hazards.

9.1.1 Hazard Mitigation Planning Team

The following individuals are Essex 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
Captain Edward Esposito Essex County Sheriff’s – Office of Emergency Management 560 Northfield Avenue, West Orange, NJ 07052 (973) 324-9750 EEsposito@EssexSheriff.com	Sanjeev Varghese, Public Works Director and County Engineer 900 Bloomfield Avenue, Verona, NJ 07044 973-226-8500 ext. 260 svarghese@essexcountynj.org

9.1.2 County Profile

Section 3 (County Profile), Volume I of this HMP includes details on Essex County’s population, location, climate, history, 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. Essex County reviews every proposed subdivision in the County. The County reviews every site plan for proposed development that will impact County facilities (e.g. stormwater pipes, county roads, etc.).

9.1.4 Capability Assessment

Essex County 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.
- Adaptive capacity for the impacts of climate change.



Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.1.4). Essex County 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 Essex County.

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 and Local	Yes	-	-
<i>Comment: NJAC 5:23-3, 14; enforced at the local level. The local municipality enforces the building code.</i>					
Zoning Code	No	Local	Yes	-	-
<i>Comment: Enforced at the local level</i>					
Subdivisions	Yes	County and Local	Yes	-	-
<i>Comment: At the county level, the Essex County Planning Board performs the review and approval for all subdivisions of land within the County. The subdivision application asks applicants to identify whether or not the site is in a floodplain. If so, they need to obtain a NJDEP permit. The site plan application asks applicants to identify existing and proposed impervious surfaces. It also asks the applicant to identify whether or not it is in the floodplain. If so, applicants will need to obtain a NJDEP permit.</i>					
Stormwater Management	No	State and Local	Yes	-	-
<i>Comment: NJDEP Rule N.J.A.C. 7:8; stormwater management is regulated at the municipal level</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
<i>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.</i>					
Growth Management	Yes	County	Yes	-	-
<i>Comment: With regards to growth management, at the County level, Essex County Department of Public Works is responsible for growth management related to county roads. Population growth and development is performed at the local level.</i>					
Site Plan Review	Yes	County	No	Yes	-
<i>Comment: Essex County performs site plan reviews prior to any local building official issuing a permit. Site plan review is performed for any proposed land development including commercial, industrial, multi-family structures containing five or more units, or any land development requiring an off-street parking area or an off-street standing area for an excess of five vehicles, or producing surface runoff directly or indirectly to a county road, on any property having frontage on a county</i>					



	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 #.
road. The site plan must be submitted to the Essex County Planning Board for their review and approval/denial. While site plan reviews are not required for residential structures containing less than five units, the County encourages developers to consult with the Planning Board. Lastly, the site plan application asks applicants if the proposed development is located in the floodplain and the amount of existing and proposed impervious surfaces.					
Environmental Protection	No	-	-	-	-
<i>Comment:</i>					
Flood Damage Prevention	No	-	-	-	-
<i>Comment: Performed and enforced at the local level</i>					
Wellhead Protection	-	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	Yes	County	No	-	-
<i>Comment: Complete Streets policy; adopted by the Board of Chosen Freeholders on April 25, 2015 making "Complete Streets" an official policy of the County. It sets a mandate for the future design of County's roads and bridges.</i>					
Planning Documents					
Comprehensive / Master Plan	No	-	-	-	-
<i>Comment:</i>					
Capital Improvement Plan	Yes	County	Allowed	Yes	-
<i>Comment: The plan is updated each year by the Engineering Division and Department of Public Works. This includes mitigation-related projects such as county roadway improvements, drainage improvements on county roads, and various studies for county-owned structures and facilities. The County also includes projects that will assist with making the County more resilient to future storms.</i>					
Disaster Debris Management Plan	Yes	County	No		
<i>Comment:</i>					
Floodplain or Watershed Plan	-	-	-	-	-
<i>Comment:</i>					



	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	No	Local	Yes – local level		
<i>Comment: These plans are developed on the local level.</i>					
Stormwater Pollution Prevention Plan	No	Local	Yes – local level	-	-
<i>Comment: While this is done at the local level, the County provides stormwater pollution prevention and reduction information on their website (http://ecdpcw.org/division_of_planning.php).</i>					
Urban Water Management Plan	-	-	-	-	-
<i>Comment:</i>					
Habitat Conservation Plan	-	-	-	-	-
<i>Comment:</i>					
Economic Development Plan	No	-	No	-	-
<i>Comment:</i>					
Shoreline Management Plan	-	-	No	-	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No	Local	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	No	Local	No	-	-
<i>Comment:</i>					
Transportation Plan	Yes	County	No	No	Yes - 2020-ESSEX COUNTY-010
<i>Comment: The Essex County Comprehensive Transportation Plan was updated in June 2013. It was developed to meet mobility and transportation safety needs across the County through the year 2035. The plan includes a description of natural and environmental resources in the County, including floodplains. The plan includes an inventory of roadways and multi-modal, in addition to a needs assessment. However, the plan does not incorporate hazard-prone areas, such as floodplains, and reducing or avoiding transportation development in hazard-prone areas. Refer to the new mitigation action 2020-ESSEX COUNTY-010 in Table 9.1-13.</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	Yes	Regional	No	Yes	-
<i>Comment: The NJTPA Passaic River Climate Resilience Planning Study - A climate resilience planning effort for transportation in the New Jersey portion of the Passaic River Basin, including parts of Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, and Union counties, was completed in June 2019. The purpose of the planning study was to identify adaptation strategies to protect transportation corridors and assets from extreme weather events, including excessive flooding, heat waves and sea level rise. The study consisted of the following activities: conduct a vulnerability assessment of the area's transportation system; project future climate risks for the Passaic River Basin; develop adaptation strategies for</i>					



	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 #.
<p><i>critical transportation corridors and assets; develop recommended actions and strategies to protect the transportation system from damage and disruption. Many of the strategies identified in this plan are already being integrated by Essex County. This includes: increasing capacity of stormwater infrastructure and drainage systems, installing energy system back-ups (e.g. generators and solar panels), incorporating redundant power and communication lines and systems, implementing green infrastructure (e.g. tree planting), conducting routine maintenance of culverts and storm sewers (county and municipal level), incorporate floodproofing where appropriate at critical facilities, and conducting maintenance on flood-impacted infrastructure.</i></p>					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other	Yes	County	No	See below	See below
<p>Comment:</p> <ul style="list-style-type: none"> • <i>Comprehensive Energy Master Plan (2011) – This plan included a review of the County’s existing energy operations at all county-owned or occupied facilities and developed a strategic energy master plan to act as a blueprint for future County initiatives concentrated at accomplishing increasing energy efficiency and conservation, reducing energy consumption, decreasing energy costs, reducing greenhouse gas emissions, identifying renewable energy options, and increasing the use of sustainable practices. Essex County is implementing these goals, including the recent installation of solar panels at the DPW headquarters located in Verona.</i> • <i>Complete Streets Policy (2015) - Complete Streets policy; adopted by the Board of Chosen Freeholders on April 25, 2015 making “Complete Streets” an official policy of the County. It sets a mandate for the future design of County’s roads and bridges.</i> • <i>Invasive Species Management Plan</i> • <i>Open Space Plan – it is expired and holding back the County’s ability to complete acquisitions (2020-ESSEX COUNTY-018)</i> • <i>Waste Water Management Plan (December 4, 2014) - This plan provides a comprehensive Wastewater Management Plan for Essex County. It is intended to project future development and the associated wastewater management and water supply requirements with that development. The planning process of this plan was designed to protect environmentally sensitive areas and to reduce pollutant loads to the groundwater. The environmentally sensitive areas are based on mapped data by NJDEP and includes wetlands, floodprone areas, and designated river areas. The plan includes mapped flood areas throughout Essex County.</i> • <i>Strategic Recovery Planning Report (SRPR)- This plan was prepared as part of the New Jersey Department of Community Affairs’ Post Sandy Planning Assistance Grant Program. Utilizing the 2015 HMP, the plan provided a recommendation of projects, categorized as hazard mitigation or preparedness. A more detailed land use analysis was conducted for the SRPR. For example, an exposure analysis was completed to assess the vulnerability of the residential and non-residential land uses within the County to flooding. This has been included in the Hazard Mitigation Plan in the appropriate hazard profiles. Since the plan was adopted, the County has worked on addressing the recommendations of the plan including the following. The County continues to work through the recommendations of the SRPR:</i> <ul style="list-style-type: none"> ○ <i>Preparing to update the current Essex County Master Plan (Essex County Transportation Plan)</i> ○ <i>Reviewing and updating zoning and land use regulations, as appropriate. While zoning is controlled by the local government, the County still provides input in what should be included.</i> 					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	County	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 #.
<i>Comment: Essex County Sheriff's Office – Office of Emergency Management is responsible for maintaining and updating the County's Emergency Operations Plan (July 6, 2021).</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	-	-	-	-
<i>Comment:</i>					
Continuity of Operations Plan	Yes	County	No	-	-
<i>Comment: updated in 2007 – County Administrator's Office in conjunction with County OEM</i>					
Public Health Plan	Yes	County	No	No	No
<i>Comment:</i> <ul style="list-style-type: none"> • <i>Clara Maass Medical Center Community Health Needs Assessment 2016-2018 – this assessment was designed to ensure that the medical center continues to effectively and efficiently serve the health needs of its service area, which includes Essex County (Belleville, Bloomfield, Newark, and Nutley). The Clara Maass Medical Center is located in Belleville and is one of the seven acute care hospitals in Essex County. The assessment looked at the five top health issues based on capacity, resources, competencies, and needs specific to the populations it serves. The issues include: access to health care, cardiovascular disease and prevention, cancer care and prevention, obesity, and respiratory care and disease prevention.</i> • <i>Newark Beth Israel Medical Center Community Health Needs Assessment 2016-2018 – this assessment was designed to ensure that the medical center continues to effectively and efficiently serve the health needs of its service area, which includes Essex County (East Orange, Irvington, Newark). The medical center is located in Newark and is one of the seven acute care hospitals in the County. The assessment looked at the seven top health issues based on capacity, resources, competencies, and needs specific to the populations it serves. The issues include: heart disease, cancer, violence, diabetes, asthma, dental conditions, and infant mortality.</i> • <i>Saint Barnabas Medical center Community Health Needs Assessment 2016-2018 – this assessment was designed to ensure that the medical center continues to effectively and efficiently serve the health needs of its service area, which includes Essex County. The medical center is located in Livingston and one of the seven acute care hospitals operating in the County. The assessment looked at the five top health issues based on capacity, resources, competencies, and needs specific to the populations it serves. The issues include: cancer, cardiovascular disease, obesity and diabetes, asthma, and reducing disparities in access to care and readmissions.</i> 					
Other	No	-	-	-	-
<i>Comment:</i>					

Table 9.1-3. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	<p>Essex County Department of Public Works issues permits to construct, improve, work on, or occupy the County's sidewalks and roadways. Anyone who wants to perform work on County streets or sidewalks needs to obtain a permit from the Department of Public Works.</p> <p>The County will review site plans that impact County facilities (e.g. roads, drainage systems, county parks, county buildings). All</p>



Criterion	Response
	subdivisions proposed in Essex County need to be by approved by Essex County Planning.
Does your jurisdiction have the ability to track permits by hazard area?	No – the County can track permits but not by hazard areas
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 County does not have a buildable lands inventory. Essex County is nearly 100% developed.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to Essex County.

Table 9.1-4. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	County Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Essex County Environmental Commission; there are numerous groups in the County completing outreach on green infrastructure and climate change, including Rutgers Cooperative Extension, Rutgers Water Resources Program and ANJEC
Open Space Board / Committee	Yes	Open Space
Economic Development Commission / Committee	Yes	Essex County Department of Economic Development, Training, and Employment
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	The Communications Center monitors and directs all field units through the use of a computer aided dispatch (CAD) system. The CAD system is capable of tracking unit locations, creating incident files, applying hazard alerts to addresses, and creating statistical reports on crime and incident data. The municipalities utilize Nixle to rely emergency alerts to residents who register with the program.
Maintenance program to reduce risk	Yes	Tree inspections/trimming; catch basin maintenance and clearing; road inspections; the County is currently developing a snow plow task force
Mutual aid agreements	Yes	Municipalities within the County, surrounding counties, UASI
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	County Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering inspectors and licensed engineers
Planners or engineers with an understanding of natural hazards	Yes	Engineering and Planning Departments
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Engineering and Planning Departments
Staff with education/knowledge/training in low impact development	Yes	Engineering and Planning Departments
Surveyors	Yes	Engineering Department
Stormwater engineer	Yes	Engineering Department



Staff/Personnel Resource	Available?	Department/Agency/Position
Personnel skilled or trained in GIS applications	Yes	Essex County Sheriff's GIS Department
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Essex County Sheriff's OEM
Grant writers	Yes	Administrator's Office
Resilience Officer	No	
Watershed planner	No	
Environmental specialist	Yes	Engineering and Planning Departments
Other	No	

FISCAL CAPABILITY

The table below summarizes financial resources available to Essex 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	No - not on county level
User Fees for Water, Sewer, Gas or Electric Service	No - not on county level
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)	Yes
Other	Yes - state and federal transportation funding, homeland security, UASI

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to Essex 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; however, it is performed by an outside consultant
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – emergency alerts on the County website, reverse 911 calls prior to and during hazard events at the municipal level
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – the County utilizes Facebook and Twitter; the various county departments have their own social media accounts
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	No
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – municipal websites



Criterion	Response
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes - emergency alerts on the County website, reverse 911 calls prior to and during hazard events at the municipal level

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to Essex County.

Table 9.1-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	N/A	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	N/A	-	-
Public Protection (Fire ISO Protection Class)	N/A	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-

N/A = 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 jurisdiction’s rating.

- Does the County have access to resources to determine the possible impacts of climate change upon the County and its municipalities? 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 – many of the recommended strategies identified in the NJTPA Passaic River Basin Climate Resilience Planning Study are currently being implemented and integrated by the County. This includes: increasing capacity of stormwater infrastructure and drainage systems, installing energy system back-ups (e.g. generators and solar panels), incorporating redundant power and communication lines and systems, implementing green infrastructure (e.g. tree planting), conducting routine maintenance of culverts and storm sewers (county and municipal level), incorporate floodproofing were appropriate at critical facilities, and conducting maintenance on flood-impacted infrastructure.

Table 9.1-8. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm (Hurricane, Tropical Storm, Nor'Easter)	Medium
Drought	Low
Earthquake	Medium
Extreme Temperature	High
Flood	High



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Geological hazards (landslide, subsidence, sinkholes)	High
Severe Weather	High
Severe Winter Weather	High
Wildfire	Low
Civil Disorder	Medium
Cyber Attack	Low
Disease Outbreak (West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus)	Medium
Economic Collapse (new)	Low
Hazardous Substances	High
Power Failure	High
Terrorism	Medium
Transportation Failure (vehicular accidents, aviation accidents, railway failures and accidents, roadway and bridge failures)	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

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.

ADDITIONAL AREAS OF EXISTING INTEGRATION

- Land Use Planning – The Essex County Planning Department supports all aspects of local planning and seeks to integrate natural hazard risk and support mitigation project identification and implementation through its planning programs and resources.
- Emergency Management Plans – Essex County continues to develop, enhance, and implement existing emergency response plans to utilize new and developing technology and information as it becomes available.
- Essex County has regularly scheduled meetings with Emergency Managers from each community. Training for all municipalities and colleges are provided for all community emergency response teams (CERT) within the County. In addition, the County has organized instructor-led training from utility companies regarding generator safety for LEPC members. LEPC meetings include agency representatives from public, private, utilities, non-profits, educational institutions.
- Coastal evacuation routes are displayed along roadways in the County.
- Essex County Health Department is currently working on conducting a countywide health assessment to get a better understanding of common concerns in each of the municipalities.
- The Sheriff’s Office and Community Affairs attend meetings to present information regarding mitigation, response, resource availability, grant programs and flood map updates at County and municipal events.
- The Sheriff’s Office provides a significant amount of safety tips on their website (<https://www.essexsheriff.com/safety-tips/>). This includes informational brochures including terrorism preparedness, severe weather driving tips, making a ‘go kit’, and winter driving tips.
- The Sheriff’s Office attends public events and distributes informational brochures about hazard risk and mitigation to attendees. Recent events include Essex County Senior Wellness Day and Essex County National Night Out.



9.1.5 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. Since 1954, Essex County has been included in 28 FEMA disaster declarations. Of which, seven were identified as hurricane events, six identified as flood events, six identified as severe storm events, four identified as snow events, two identified as drought events, two identified as other (West Nile Virus and water shortage), and one identified as fire. A summary of historical events appears in each hazard profile of the plan and includes a chronology of events that have affected the County and its municipalities.

9.1.6 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 9.1-9 summarizes the Essex County risk assessment results and data used to determine the hazard ranking. The following summarizes the hazards of greatest concern and risk to Essex County.

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 9.1-9. Summary of Risk Assessment Results

Hazard	Hazard Scenario/ Area Evaluated	Category			Certainty Factor
		Estimated Countywide Impacts			
		Population ^d	Buildings/Critical Facilities and Lifelines	Economy ^a	
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA Sea Level Rise: NOAA +1ft and +3ft rise	Coastal Erosion: 270 people impacted +1ft Rise: 28 people displaced +3ft Rise: 251 people displaced	Coastal Erosion (# located in CEHA): <ul style="list-style-type: none"> ▪ 42 buildings ▪ 5 critical facilities ▪ 0 lifelines +1ft Rise (# lost): <ul style="list-style-type: none"> ▪ 8 buildings ▪ 5 critical facilities ▪ 0 lifelines +3ft Rise (# lost): <ul style="list-style-type: none"> ▪ 43 buildings ▪ 6 critical facilities ▪ 0 lifelines 	Coastal Erosion (\$ building RCV located in CEHA): <ul style="list-style-type: none"> ▪ \$42.3 Million +1ft Rise ((\$ RCV lost): <ul style="list-style-type: none"> ▪ \$18.7 Million +3ft Rise ((\$ RCV lost): <ul style="list-style-type: none"> ▪ \$68.4 Million 	High
Coastal Storm	100-year MRP (Tropical Storm-Category 1)	Entire County population exposed 14,885 residents located in Category 1 storm surge inundation area	2,192 buildings (\$6.3 Billion RCV) located in Category 1 storm surge inundation area	\$69 Million building RCV damage due to wind	High
Drought	Drought event	Entire County population exposed; impacts to health and safety of individuals are estimated to be minimal.	Critical facility functionality may be impacted (e.g., water source for fire services); overall impacts to structures are low.	Industries that rely on water for business could be impacted the most; 22 farms in County; Increased demand for water and electricity can result in shortages and higher costs for these resources.	Low
Earthquake	100-Year Mean Return Period Event	Entire population exposed 1 displaced household 122,291 residents located on earthquake-vulnerable soils	Located on Vulnerable Soils (NEHRP Soils D&E; high liquefaction susceptibility): <ul style="list-style-type: none"> ▪ \$33.8 billion building RCV ▪ 220 critical facilities ▪ 73 lifelines 	<ul style="list-style-type: none"> ▪ \$1.2 Million RCV building damages ▪ >1,000 tons of building debris ▪ \$515,000 income loss 	High



Hazard	Hazard Scenario/ Area Evaluated	Category			Certainty Factor
		Estimated Countywide Impacts			
		Population ^d	Buildings/Critical Facilities and Lifelines	Economy ^a	
Extreme Temperature	Extreme temperature event (heat or cold)	Entire County population exposed; Vulnerable populations: elderly, youth, individuals with chronic medical conditions; low income	Critical facility functionality may be impacted if without backup power source	22 farms in County; 11 farm operators report farming as primary occupation	Low
Flood	100-Year Mean Return Period Event	32,128 residents living in the SFHA	Located in the SFHA: <ul style="list-style-type: none"> ▪ 6,481 buildings ▪ 82 critical facilities ▪ 24 lifelines 	>\$2 Billion in estimated RCV loss	High
Geological	High Landslide Susceptibility Areas	2,652 residents located in Class A and B susceptibility areas (<1% of population)	<ul style="list-style-type: none"> • 612 buildings located in Class A and B susceptibility areas • 2 critical facilities • 2 lifelines 	\$403 Million building RCV located in Class A and B susceptibility areas	Moderate
Severe Weather	Severe Weather Event	Entire population exposed	All buildings exposed	Event-dependent	Low
Severe Winter Weather	Severe Winter Weather Event	Entire population exposed	All buildings exposed	Event-dependent	Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	478 residents located in high, very high, and extreme wildfire hazard area (<1% of population)	<ul style="list-style-type: none"> • 122 buildings located in wildfire hazard area • 1 critical facility • 0 lifelines 	\$221 million building RCV located in wildfire hazard area	Moderate
Civil Disorder	Civil disorder event	The degree of impact to the population depends on the scale of the incident. Population in the immediate vicinity will be impacted.	The degree asset impacts depend on the scale of the incident. Assets in the immediate vicinity will be impacted.	The degree of economic impact depends on the scale of the incident.	Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.	Physical damages due to a cyber-attack may be limited; loss of utilities/communication would have Countywide impacts and could result in loss of emergency services.	The degree of economic impact depends on the scale of the incident. This can range but can be great depending upon the sector impacted.	Low
Disease Outbreak	West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis,	Entire population exposed; The degree of impact to the	Loss of services; Potential temporary closure of ports of entry impacting import/export of goods and vital	Impacts to food supply and water supply; Costs of activities and programs	Low





Hazard	Category				Certainty Factor
	Hazard Scenario/ Area Evaluated	Estimated Countywide Impacts			
		Population ^d	Buildings/Critical Facilities and Lifelines	Economy ^a	
	La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	population depends on the scale of the incident	resources; Overcrowding of local medical clinics and hospitals depending on severity	implemented to address outbreaks and prevent spread.	
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Physical damages due to economic collapse may be limited; structures and facilities that cannot afford the maintenance to remain open may become abandoned/rundown	The degree of damages depends on the scale of the incident. The hazard could cause massive impacts Countywide through loss of jobs, businesses, and tax revenue.	Low
Hazardous Substances^b	Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County: <ul style="list-style-type: none"> • Fairfield: 2 • Glen Ridge: 1 (Deleted) • Montclair/West Orange: 1 (Deleted) • Newark: 4 • Orange: 1 • West Orange/ Orange: 1 	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.	The degree asset impacts depend on the scale of the incident. Assets in the immediate vicinity will be impacted.	The degree of economic impact depends on the scale of the incident.	Low
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to asset depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps); Loss of communication would impact emergency services.	The degree of economic impact depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of physical damages depends on the scale of the incident. Assets in the immediate vicinity will be most impacted.	The degree of economic impact depends on the scale of the incident. This can range.	Low





Hazard	Category				Certainty Factor
	Hazard Scenario/ Area Evaluated	Estimated Countywide Impacts			
		Population ^d	Buildings/Critical Facilities and Lifelines	Economy ^a	
Transportation Failure	Vehicular accidents, Aviation Accidents, Railway Accidents	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of physical damages depends on the scale of the incident. Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

Refer to the municipal annexes for details on the number of repetitive loss, severe repetitive loss, and the number of mitigated properties in each municipality.

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines owned by the County located in the 1-percent and 0.2-percent floodplain and whether or not the facility has already been mitigated, or a project is identified and included in the updated mitigation strategy.

Table 9.1-10. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
ECSO Equipment Storage Facility	Police	X	X	2020-ESSEX COUNTY-019
ECSO Bureau of Narcotics	Government		X	Bureau of Narcotics has been relocated and located on the second floor of the building located at 115 Clifton Ave., Newark; the OEM offices at this facility have been mitigated (elevated)
Essex County Airport	Airport	X	X	Essex County Improvement Authority owns the airport – communicate with the Authority to recommend mitigation measures – 2020-ESSEX-020
Essex County Correctional Facility	Correctional Institution	X	X	Purchase additional high water vehicles (2020-ESSEX COUNTY-014) as a mode of transportation to and from the facility; floodwalls are not feasible due to the deployment and storage of floodwalls; it is not feasible to elevate the structure

ADDITIONAL IDENTIFIED VULNERABILITIES

Refer to Section 4 (Risk Assessment) and the municipal annexes for vulnerable areas throughout the County.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for Essex 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 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 Essex County has significant exposure. Count maps are located in each hazard section in the Risk Assessment (Section 4).

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 Essex 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 Essex County. The Steering Committee and Planning Committee reviewed the Essex 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.

- The County adjusted the calculated draft 2020 ranking for wildfire from low to medium due to the lack of sufficient response equipment (refer to Table 9.1-13, action 2020-ESSEX COUNTY-12) and insufficient hydrant capacity and tenders on hand (action 2020-ESSEX COUNTY-15).
- The County adjusted the calculated draft 2020 ranking for terrorism from low to high. This is because the County has several high-profile locations (hospitals, schools, commercial establishments) and critical infrastructure in the County.

Table 9.1-11. Essex County Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Medium	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Medium	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Medium	Medium	Medium	High	High	Medium

9.1.7 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 County’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 updated mitigation strategy (Table 9.1-13) followed by its prioritization (Table 9.1-14). 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. Appendix X provides all attributes associated with the 2015 HMP mitigation strategy.

Table 9.1-12. 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 #
Essex-1	Support and obtain backup power and alternative energy sources to ensure continuity	Essex County Sheriff’s Office	In Progress – a portion of this action has been completed	X	2020-ESSEX





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 #
	of operations. Sites currently identified: 1. Essex County K9/Bomb building 2. DPW building generator 3. Essex County Patrol Division Headquarters generator (Newark) 4. Essex County OEM Storage/Crime Scene Facility (Orange) generator 5. Essex County DPW/Fleet Headquarters generator 6. DPW/Roads and Bridges Headquarters (Cedar Grove) 7. Catholic Charities of the Archdiocese of Newark shelter		using FEMA mitigation grants from Superstorm Sandy. Generators were purchased for the following: <ul style="list-style-type: none"> DPW building generator (900 Bloomfield Ave., Verona) Essex County Patrol Division Headquarters generator (525 W Market St., Newark) Essex County DPW/Fleet Headquarters (99 West Bradford Ave., Cedar Grove) DPW/Roads and Bridges Headquarters (99 West Bradford Ave., Cedar Grove) 		COUNTY-001
Essex-2	Essex County Traffic Control Transfer Switch generator	Essex County Sheriff's Office	No Progress – due to lack of matching funds	X	2020-ESSEX COUNTY-002
Essex-3	Newark AIDS Consortium, INC. Broadway House: Newark AIDS Consortium INC. Broadway House for Continuing Care generator	City of Newark	No Progress – remove from the HMP; the facility never applied for funding		
Essex-4	Seton Hall University: Seton Hall University generator project	Seton Hall University	No Progress – remove from the HMP; the facility never applied for funding		
Essex-5	Repair bridge into Senior Recreational Center (Belleville Old Mill St.) (Old initiative)	County Engineering Office	Completed in 2016/2017		
Essex-6	Rehabilitate bridges requiring structural work. Five vulnerable county bridges have been identified at this time. <ul style="list-style-type: none"> Center Street Bridge in Nutley Hoover Ave Bridge in Bloomfield Cherry Hill Bridge in Millburn Dougall Street Bridge in West Caldwell Lyons Ave Bridge in Irvington 	County Engineering Office	In Progress - two bridges complete (Center Street Bridge in Nutley and Lyons Ave. bridge in Irvington); have funding set aside to complete		
Essex-7	Utilize the recommendations of the Strategic Recovery Planning Report to further identify roadway flooding upon county roadways and to develop future mitigation actions to address those issues (Old initiative)	County Engineering Office	Ongoing Capability – County has been working through SRPR recommendations		
Essex-8	Enlarge drainage system on JFK Parkway in Millburn. JFK is a county owned roadway as well as an evacuation route. (Old initiative)	County Engineering Office	In Progress	X	2020-ESSEX COUNTY-003
Essex-9	Enlarge drainage system on Bloomfield Ave in Verona. Bloomfield Ave is a county owned roadway as well as an evacuation route. (Old initiative)	County Engineering Office	Complete – improvements in this section of Verona have been completed		
Essex-10	Stream culvert work in residential areas storm water run-off– Eagle Rock Reservation area including Afterglow Ave. and Ravine Rd and flooding of Cole Rd. (Old initiative)	County Engineering Office	In Progress – this work is in progress by the County; will not be included in the HMP		
Essex-11	Conduct a study to evaluate drainage systems on roadways to reduce the impacts of flooding. Areas identified to date: Passaic Avenue and Bloomfield Avenue in Verona which are both	County Engineering Office	Ongoing – the County knows where the problem is but work still needs to be done	X	2020-ESSEX COUNTY-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 #
	evacuation routes (Old initiative)				
Essex-12	Purchase three 525 gallon potable water trailers	Essex County Sheriff's Office	No Progress	X	2020-ESSEX COUNTY-005
Essex-13	Provide redundant methods for Voice/Data transmissions 4G wireless broadband at DPW Headquarters.	Sheriff's Communication Bureau	No Progress	X	2020-ESSEX COUNTY-006
Essex-14	Purchase 4 digital sign boards with variable message capability	Essex County Sheriff's Office of Emergency Management	Complete		
Essex-15	Purchase portable flood wall which will be deployed prior to a flooding event to protect critical County facilities	County Engineering Office	No Progress; at the time of the plan update, this option is not feasible		
Essex-16	Install quick-connects for emergency generators at nine County fueling stations	County Engineering Office	In Progress – one facility has been completed	X	2020-ESSEX COUNTY-007
Essex-17	Install a County-Wide emergency alert system	Essex County Sheriff's Office of Emergency Management	No Progress	X	2020-ESSEX COUNTY-008
Essex-18	Conduct a functional exercise related to school safety	Essex County Sheriff's Office	No Progress	X	2020-ESSEX COUNTY-009
Essex-19	Administratively and financially support installing flood control measures in flood zone areas to protect critical facilities (i.e., levees, trenches, sump pump systems) or obtain equipment to address short-term needs (i.e., pumps) These facilities include the following at this time: 1. County Detention Facility in Newark – Essex County Correctional Facility 2. Passaic Valley Sewerage Commission	Essex County Sheriff's Office of Emergency Management	At the time of this plan update, this action is not technically feasible for the County; therefore, it will not be included in the 2020 HMP		
Essex-20	Pursue Sandy Recovery Planning Assistance Grant from NJ Department of Community Affairs	Division of Planning	Complete– The SRPR plan is complete		
Essex-21	Develop a five year plan for capital projects directly linked to recovery, mitigation or preparedness	Division of Planning	Ongoing Capability – plans are updated every 5 years and the County includes projects that will assist with making the County more resilient to future storms		
Essex-22	Update the County Master Plan with a Community Resiliency Element that reviews the Land Use Plan Element and development standards against the vulnerability issues outlined in this SRPR and adopt as a Master Plan Element.	Division of Planning	No Progress – County does not have a specific plan; will start updating in 2020/2021 – the only thing they can control is transportation	X	2020-ESSEX COUNTY-010
Essex-23	Review zoning and land use regulations against the vulnerability issues outlined in this SRPR and develop amendments to anticipate necessary changes to height, bulk and setback requirements needed to improve resiliency based on recommendations in the Community Resiliency Element	Division of Planning	Ongoing Capability – always changing and evolving – zoning controlled by local governments		



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 #
Essex-24	Develop specific strategic plans for neighborhoods most severely impacted by Sandy, including the "Island" neighborhood in the Ironbound and impacted neighborhoods in Fairfield Township	Division of Planning	No Progress – not applicable to the county because they have limited planning jurisdiction in these areas		
Essex-25	Review existing permitting procedures to determine improvements for fast-tracking/streamlining for expediting projects directly related to recovery or mitigation and that are consistent with adopted Design Standards	Division of Planning	Ongoing Capability – This is the Division of Planning's responsibility and already conducts these reviews. This is considered a capability.		
Essex-26	Develop design standards to address the visual impact of mitigation measures such as elevating bulkheads, elevating buildings on foundations or pilings, etc. Such design standards might include requirements for skirting exposed pilings, parking under the lowest habitable floor, using exterior decking to stagger stairways to elevated first floor levels, etc.	Division of Planning	No Progress – County cannot give design standards, this would need to be done at the jurisdictional level		
Essex-27	Develop a County Multi-jurisdiction Wildfire Preparedness Plan. Identify updated drafting locations in the reservation to ensure accessibility for pump trucks.	Essex County Sheriff's Office of Emergency Management	No Progress	X	2020-ESSEX COUNTY-011
Essex-28	Purchase a wildfire "brush truck" to combat wildfires within County	Essex County Sheriff's Office of Emergency Management	No Progress	X	2020-ESSEX COUNTY-012
Essex-29	Provide continued education, training and exercise opportunities to first responders and other local officials regarding floodplain management, natural and human-caused hazards and the Community Rating System.	Essex County Sheriff's Office of Emergency Management	Ongoing Capability - This is considered a capability. The Sheriff's Office		
Essex-30	Adopt new County roof standards to mitigate natural hazards	Division of Planning	No Progress – this is done at the state level building code (UCC)		
Essex-31	Revise County development standards which are used when evaluating private development along County roads to include more resilient building standards.	Division of Planning	Ongoing Capability – next revisions will be done in 2021		
Essex-32	Construct new Passaic River bridge crossing in the Newark area to relief currently overburdened bridges and provide additional traffic redundancy in case of another hazard	Essex County Department of Public Works	No Progress – keep in the 2020 HMP- would need to work with Hudson County	X	2020-ESSEX COUNTY-013
Essex-33	Acquire additional high water vehicles that will permit ingress/egress of essential personnel and supplies during disasters	Essex County Sheriff's Office of Emergency Management	In Progress – Sheriff's Office has a few; County could use more (DPW)	X	2020-ESSEX COUNTY-014
Essex-34	Retrofit the County Dispatch Communications Center in Newark for flood and high winds.	Essex County Sheriff's Office of Emergency Management	No Progress – remove from the HMP		

In addition to the above progress, Essex County identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Essex County OEM building is located in the floodplain and experienced flood damages in the past. The building has been mitigated by elevating one foot above the base flood elevation.





- Essex County received federal funds as a result of Superstorm Sandy in 2012. The County utilized grant funding to purchase and install backup power capabilities at critical facilities to provide continuity of operations during power outages:
 - Purchased and install photovoltaic power generation system (solar panels) at the DPW headquarters located at 900 Bloomfield Avenue in Verona
 - Purchased generators for critical facilities – DPW building at 900 Bloomfield Avenue in Verona, Essex County Patrol Division Headquarters in Newark, DPW fleet headquarters in Cedar Grove, and Roads/Bridges Headquarters in Cedar Grove.
- The County received FEMA Pre-Disaster Mitigation funding to update the 2015 HMP.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

Essex County participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The County participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; available federal and state funding sources, 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 X (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.1-13 summarizes the comprehensive-range of specific mitigation initiatives Essex County would like to pursue in the future to reduce hazard impacts; some actions have been carried forward from the 2015 HMP. 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 County 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High, Medium, or Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.1-14 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.



Table 9.1-13. 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-ESSEX COUNTY-001 (previous action)	Backup power for County facilities	<p>Problem: Several County facilities do not have backup power to provide continuity of operations during a utility interruption. These facilities provide essential services to Essex County and its residents.</p> <p>Solution: Obtain backup power for the following facilities:</p> <ul style="list-style-type: none"> Essex County K9/Bomb building – portable generator OEM Storage/Crime Scene Facility – portable generator 	Existing	Utility Interruption	2, 6	Essex County Sheriff's Office	FEMA HMGP	Provide continuity of operations to the County during utility interruptions	\$100,000	2 years	High	SIP	PP, ES
2020-ESSEX COUNTY-002 (previous action)	Essex County Traffic Control Transfer Switch generator	<p>Problem: The Essex County traffic control transfer switch does not have backup power. During a utility interruption, this system cannot function properly and can create a transportation hazard for County personnel and residents.</p> <p>Solution: Purchase a portable generator to use during a utility interruption to operate the County's traffic control transfer switch.</p>	Existing	Utility Interruption	2, 6	Essex County Sheriff's Office	FEMA HMGP	Allow transfer switch to operate during utility interruptions	\$100,000	2 years	High	SIP	PP, ES
2020-ESSEX COUNTY-003 (previous action)	Enlarge drainage system on JFK Parkway in Millburn	<p>Problem: During heavy rains, JFK Parkway in Millburn becomes inundated due to the drainage systems becoming overwhelmed. This leads to road closures, creating a hazard for emergency personnel and residents.</p> <p>Solution: Enlarge the drainage system on JFK Parkway in Millburn to reduce or eliminate flooding that occurs in this area.</p>	Existing	Coastal Storm, Severe Weather, Flood	1, 2	County Engineering Office	CDBG, TIGER, County Budget	Reduces or eliminates flood damage, allow road to remain open during heavy rain events	\$1 million	5 years+	Medium	SIP	PP
2020-ESSEX COUNTY-004 (previous action)	Evaluate drainage systems in Essex County	<p>Problem: The drainage systems in the area of Passaic Avenue and Bloomfield Avenue in Verona and JFK Parkway in South Orange and Millburn become overwhelmed during heavy rain events, leading to flooding of roadways and surrounding properties. This results in road closures, restricting access to these sections of the County.</p> <p>Solution: Conduct a study to evaluate drainage systems on roadways to reduce the impacts of flooding. The systems include: Passaic Avenue and Bloomfield Avenue in Verona and JFK Parkway in Millburn and South Orange.</p>	Existing	Coastal Storm, Severe Weather, Flood	1, 2	County Engineering Office Essex County Sheriff's Office	FEMA PDM and HMGP, County Budget	Identifies options to alleviate the drainage problems	\$100,000	5 years	Medium	LPR	PR
2020-ESSEX	Potable Water Trailers	<p>Problem: During an event that causes utility interruptions, impacting drinking water supplies</p>	Both	Severe Weather,	1, 6		UASI, County Budget	Provides potable water	\$5,000	2 years	Medium	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
COUNTY-005 (previous action)		for residents, the County has limited resources to provide potable water. Solution: Purchase three 525-gallon potable water trailers to use in the event drinking water is not available to County residents.		Drought, Wildfire, Utility Interruption		<u>Sheriff's Communication Bureau County Engineering Office</u>		for residents during an outage					
2020-ESSEX COUNTY-006 (previous action)	Voice / Data transmissions at DPW Headquarters	Problem: Inadequate and insufficient communications and capacity at the DPW headquarters location. Solution: Provide redundant methods for Voice/Data transmissions 4G wireless broadband at DPW Headquarters.	Existing	All	1, 6	<u>Sheriff's Communication Bureau, County DPW</u>	UASI, USDA Telecommunications Loan, DHS Emergency Management Performance Grant, County Budget	Increase communication capabilities in the County	\$100,000+	1 year	Medium	SIP	PP, ES
2020-ESSEX COUNTY-007 (previous action)	Install quick-connects for emergency generators at eight County fueling stations	Problem: There are eight fueling stations in Essex County. The stations use generators during utility interruptions but the fuel pumps need to be hard wired in order to work properly. Solution: Install a quick connect system at the fueling stations to allow generators to run the fuel pumps when needed.	Existing	Utility Interruption	1, 2, 6	<u>County Engineering Office</u>	UASI, FEMA HMGP and PDM	Allows portable generators to be used to run fueling stations; provides fuel for emergency vehicles during utility interruptions	\$10,000	2 years	High	SIP	PP, ES
2020-ESSEX COUNTY-008 (previous action)	Install a County-Wide emergency alert system	Problem: Essex County does not have a countywide emergency alert system. Many of the municipalities utilize Nixle to relay emergency alerts to residents who registered. Solution: Research the various countywide alert systems and identify the best one for Essex County. Install a countywide emergency alert system which will increase communication capabilities with residents in the County.	New	All	1, 2, 3, 6	<u>Essex County Sheriff's Office of Emergency Management</u>	UASI, FEMA HMGP and PDM	Provides an alert system that reaches all residents	\$300,000	1 year	High	EAP	PI, ES
2020-ESSEX COUNTY-009 (previous action)	Conduct a functional exercise related to school safety	Problem: Through the years, school safety has evolved and become more complex. Recent tragic events that have occurred in schools across the County has increased the need to provide additional safety training in schools for various incident types (e.g. active shooter, hazardous materials release, explosions). Solution: Exercises are one of the core elements of the preparedness phase of emergency management. The Sheriff's Office will develop	Existing	All	1, 2, 4, 6	<u>Essex County Sheriff's Office</u>	UASI, DHS, School Budget, Staff Time	Increases training and awareness, simulates an incident in the most realistic manner, tests the school's emergency plan before an	\$50,000	3 years	Medium	EAP	PI, 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
		functional emergency exercises specific to school safety concerns (e.g. active shooter, hazardous materials release, explosions). Once the exercises are developed, the Sheriff's Office will conduct the exercises with schools in the County.						actual emergency occurs					
2020-ESSEX COUNTY-010 (previous action)	Update Transportation Plan	<p>Problem: The current transportation plan does not include a community resiliency element outlined in the County's SRPR.</p> <p>Solution: When updating the County's transportation plan in 2020/2021, a community resiliency element will be incorporated as appropriate. The plan will also incorporate hazard areas identified in the 2020 Essex County HMP and create goals related to reducing impacts to hazards, such as floodplains and areas with steep slopes.</p>	Both	All	5, 6	Division of Planning	County Budget	Increases resiliency	<\$10,000	2 years	High	LPR	PR
2020-ESSEX COUNTY-011 (previous action)	Wildfire Preparedness Plan	<p>Problem: The County currently does not have a wildfire preparedness plan. Additionally, the list of drafting locations in the County is in need of updating.</p> <p>Solution: Develop a County Multi-jurisdiction Wildfire Preparedness Plan. Identify updated drafting locations in the reservation to ensure accessibility for pump trucks.</p>	Both	Wildfire	1, 2, 4, 5	Essex County Sheriff's Office of Emergency Management	County Budget	Provides a plan to prepare for wildfires and identify water sources to use during a wildfire	\$40,000	5 years	Medium	LPR	PR
2020-ESSEX COUNTY-012 (previous action)	Purchase a brush truck	<p>Problem: The County does not have proper equipment to respond to wildfires. In the event of a wildfire, the County needs to wait for surrounding communities for the State Forest Fire Service to arrive to assist with firefighting.</p> <p>Solution: Purchase a wildfire "brush truck" to combat wildfires within County</p>	Both	Wildfire	1, 2, 6	Essex County Sheriff's Office of Emergency Management	UASI, FEMA Assistance to Firefighters Grant	Provides equipment for wildfires, increases response rate to wildfires	\$100,000	5 years	Medium	SIP	ES
2020-ESSEX COUNTY-013 (previous action)	Passaic River Bridge Crossing	<p>Problem: The County is densely populated. In the event people need to enter or leave Essex County due to a hazard event, there are limited bridge crossings. During emergencies, traffic is extensive and makes it difficult to enter or leave the County in a timely matter.</p> <p>Solution: Work with Hudson County to construct a new Passaic River bridge crossing in the Newark area to relief currently over-burdened bridges and provide additional traffic redundancy in case of another hazard.</p>	Both	All	1, 2, 6	Essex County Department of Public Works, Hudson County	County Budget, Capital Improvements, NJDOT	Provides another route to evacuate the County if needed, reduces traffic	\$1 million+	5+ years	Medium	SIP	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
2020-ESSEX COUNTY-014 (previous action)	High Water Vehicles	Problem: High water vehicles are needed to respond during a flood event. While some departments have high water vehicles, more are needed for different departments. There are several County-operated critical facilities that are floodprone (e.g. County Detention Facility)	Both	Coastal Storm, Flood, Severe Weather	1, 2	<u>Essex County Sheriff's Office of Emergency Management</u>	UASI, County Budget	Continuity of operations during a flood event; provides emergency services to residents	\$100,000+	3 years	Medium	SIP	ES
		Solution: Acquire additional high water vehicles that will permit ingress/egress of essential personnel and supplies during disasters											
2020-ESSEX COUNTY-015	Water Tender for County	Problem: There are several areas in the County with limited area fire hydrants. This can create an issue if a fire occurs in areas with limited water resources for firefighting.	Both	Wildfire and Structural Fires	1, 6	<u>Essex County OEM and County Fire Coordinator</u>	UASI, FEMA Assistance to Firefighters Grant	Increase County fire capabilities; life safety; property protection	\$80,000	Within 5 years	Medium	SIP	PP, ES
		Solution: Purchase a water tender(s) to assist with firefighting in areas of limited fire hydrants.											
2020-ESSEX COUNTY-016	Riker Hill Art Park Hydrants	Problem: Identified during a focus group session: Riker Hill Park in Livingston needs additional fire hydrants for firefighting.	New	Wildfire and Structural Fires	1, 6	<u>Essex County OEM with support from Livingston Township officials</u>	County Budget	High	High	Medium	High	SIP	PR, PP
		Solution: Extend the water main to Riker Hill Park to provide proper fire protection to buildings.											
2020-ESSEX COUNTY-017	Natural Gas Generators Inventory	Problem: PSE&G does not have a list of facilities that have natural gas generators. If they have a list, they can provide continuous supply if a planned outage/shut off option is implemented during hazard events.	Both	All	1, 2, 6	<u>Essex County OEM and Essex County DPW</u>	County Budget	Provide an understanding of critical facilities and their need for natural gas during utility interruptions; allow for continuity of operations	\$25,000	Within 2 years	Medium	LPR	PR, ES
		Solution: The County will prepare a list critical facilities that use natural gas generators. The list will be shared with PSE&G and updated as appropriate. This will allow PSE&G to provide natural gas to these critical facilities and allow them to remain operational during utility interruptions.											
2020-ESSEX COUNTY-018	Update Open Space Plan	Problem: The County's <i>Park, Recreation, and Open Space Master Plan</i> was adopted on April 10, 2003. It is currently out of date. Without an updated plan, it impacts the County's capabilities of conducting property acquisitions.	Existing	Flood, Severe Weather	1, 2, 6	<u>Essex County Department of Parks, Recreation and Cultural Affairs</u>	County Budget	Identify potential locations to turn into open space, increases flood storage, increases open space in county (social	\$50,000	Within 4 years	Medium	LPR	PR
		Solution: Update the existing <i>Essex County Park, Recreation and Open Space Master Plan</i> to identify locations to acquire properties to turn into open space.											



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
								benefits), removes floodprone properties					
2020-ESSEX COUNTY-019	Critical Facility in Floodplain - ESCO Equipment Storage Facility	<p>Problem: The Essex County Sheriff's Office Equipment Storage facility is located at 530 Thomas Blvd. in Orange. The facility is located in the 1% annual chance floodplain. While it does not have a history of flooding or flood damages, by being located in the floodplain, it has the potential of being damaged by future flood events.</p> <p>Solution: The Sheriff's Office will evaluate the storage facility and identify what needs to be mitigated (electrical equipment, supplies, etc.). Once the evaluation is complete and solutions are identified, the Sheriff's Office will implement those solutions. The solutions can include elevating electrical equipment above the base flood elevation, use sand bags to create barrier around facility prior to flood events, and moving equipment prior to flood events to protect from damage.</p>	Existing	Flood	1, 2, 6	Essex County Sheriff's Office	FEMA HMGP or FMA, County Budget	Identify solutions to protect from future flood events	<\$10,000 to perform evaluation; costs to mitigate depend on solutions chosen	Within 2 years	High	LPR, SIP	PR, PP
2020-ESSEX COUNTY-020	Critical Facility in floodplain - Essex County Airport	<p>Problem: The Essex County Airport is operated by the Essex County Improvement Authority. The airport is located in the 1% annual chance floodplain. Being located in the floodplain can make it susceptible to flood-related damages.</p> <p>Solution: The Sheriff's Office will notify the Improvement Authority that the airport is located in the floodplain and determine if the facility is protected from floods. If the facility is not protected, the Sheriff's Office will provide mitigation options that the Improvement Authority can consider protecting the airport's critical assets.</p>	Existing	Flood	1, 2, 6	Essex County Sheriff's Office working with the Essex County Improvement Authority	County Budget	Identify solutions to protect from future flood events; education property owner/operator	<\$10,000	Within 1 year	High	LPR	PR
2020-ESSEX COUNTY-021	Community Health Needs Assessment for Essex County	<p>Problem: While the major hospitals that serve Essex County each have a Community Health Needs Assessment, the County does not have one that specifically looks at countywide using primary data sources.</p>	N/A	Disease Outbreak		Essex County Health Department with support from municipal	Department Budget	Identify health issues in Essex County using primary sources (rather	\$20,000	Within 1 year	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
		Solution: Essex County Health Department will lead the efforts to conduct a Community Health Needs Assessment for the County. They will use primary source health data through the municipal health departments, conduct a community health survey, and involve other county and community stakeholders. This assessment will determine the top three health issues in Essex County. After the assessment is complete, the Health Department will develop appropriate public outreach and education materials.				health departments		than secondary sources), better understanding of health concerns across the county, working with municipalities					
2020-ESSEX COUNTY-022	Essex County Bridges	<p>Problem: There are four bridges that cross the Passaic River that are owned with Essex County: 1. Clay Street; 2. Jackson Street, 3. Harrison Ave., 4. Keyland Ave. These bridges serve as evacuation routes and increased capacity is needed in addition to addressing issues with erosion/pilings.</p> <p>Solution: Essex County will work with Hudson County (where appropriate) to replace these bridges in coordination with the New Jersey Transportation Authority (NJTPA) and U.S. Federal Highway Administration (FHWA). Erosion control and upgrade of pilings is included. To date the local concept development has been completed; design phase is scheduled for the next 6-8 months. \$30-80 Million to replace each bridge.</p>	New and Existing	All	1, 2, 6	Essex County Engineering with support from Hudson County Engineering	FHWA	Increase safety of bridges, provide evacuation routes, increases capacity, reduces erosion	\$320 million	Within 5 years	High	SIP, NSP	PP, ES, NR
2020-ESSEX COUNTY-023	Dam deficiencies in the County	<p>Problem: There are several dams present in the County; some of which are high hazard dams. Their deficiencies for mitigation are unknown at this time.</p> <p>Solution: The HMP Coordinator (Essex County Sheriff's Office) will include in the next HMP update grant scope of work to reach out to NJDEP to establish ownership of dams in the County and identify opportunities for mitigation in coordination with the municipalities. This will enable municipalities to identify ownership, jurisdiction and next steps to mitigate deficient dams in the County leveraging grant funding.</p>	Both	Flood	1, 2	Essex County Sheriff's Office	FEMA HMA; FEMA Rehabilitation of High Hazard Potential Dam Grant Program	Increases safety of population and downstream assets	High	Within 5 years	High	LPR	PR

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 9.1-14. 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-ESSEX COUNTY-001 (previous action)	Backup power for County facilities	1	1	1	1	1	1	1	0	1	1	1	1	1	0	12	High
2020-ESSEX COUNTY-002 (previous action)	Essex County Traffic Control Transfer Switch generator	1	1	1	1	1	1	1	0	1	1	1	1	1	0	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-ESSEX COUNTY-003 (previous action)	Enlarge drainage system on JFK Parkway in Millburn	1	1	1	1	1	1	0	1	0	1	0	0	1	0	9	Medium
2020-ESSEX COUNTY-004 (previous action)	Evaluate drainage systems in Essex County	1	1	1	1	1	1	0	1	0	1	0	0	0	0	8	Medium
2020-ESSEX COUNTY-005 (previous action)	Potable Water Trailers	1	0	1	0	1	1	0	0	1	1	1	1	0	0	8	Medium
2020-ESSEX COUNTY-006 (previous action)	Voice / Data transmissions at DPW Headquarters	1	0	1	0	1	1	0	0	1	1	1	1	0	0	8	Medium
2020-ESSEX COUNTY-007 (previous action)	Install quick-connects for emergency generators at eight County fueling stations	1	1	1	1	1	1	0	1	1	1	0	0	1	0	10	High
2020-ESSEX COUNTY-008 (previous action)	Install a County-Wide emergency alert system	1	1	1	1	1	1	0	0	1	1	1	0	0	0	9	High
2020-ESSEX COUNTY-009 (previous action)	Conduct a functional exercise related to school safety	1	0	1	0	1	1	0	0	1	1	0	1	1	0	8	Medium
2020-ESSEX COUNTY-010 (previous action)	Update Transportation Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-ESSEX COUNTY-011 (previous action)	Wildfire Preparedness Plan	1	1	1	1	1	1	0	1	1	0	0	0	0	0	8	Medium
2020-ESSEX COUNTY-012 (previous action)	Purchase a brush truck	1	1	1	1	1	1	0	1	1	0	0	0	0	0	8	Medium
2020-ESSEX COUNTY-013 (previous action)	Passaic River Bridge Crossing	1	1	1	1	0	1	0	1	1	1	1	0	0	0	8	Medium
2020-ESSEX COUNTY-014 (previous action)	High Water Vehicles	1	0	0	1	0	1	0	0	1	1	1	1	1	0	8	Medium
2020-ESSEX COUNTY-015	Water Tender for County	1	0	1	1	0	0	0	0	1	1	1	1	0	0	7	Medium
2020-ESSEX COUNTY-016	Riker Hill Art Park Hydrants	1	1	1	1	0	1	0	1	0	1	1	1	0	0	9	High
2020-ESSEX COUNTY-017	Natural Gas Generators Inventory	1	1	1	1	0	1	1	0	0	1	1	0	0	0	8	Medium
2020-ESSEX COUNTY-018	Update Open Space Plan	1	1	1	1	0	1	1	0	0	1	1	0	0	0	8	Medium
2020-ESSEX COUNTY-019	Critical Facility in Floodplain - ESCO Equipment Storage Facility	1	1	1	1	1	1	1	0	0	1	0	1	1	0	10	High
2020-ESSEX COUNTY-020	Critical Facility in floodplain – Essex County Airport	1	1	1	1	1	1	1	0	0	1	0	1	1	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-ESSEX COUNTY-021	Community Health Needs Assessment for Essex County	1	1	1	1	1	1	1	1	1	1	0	1	1	0	12	High
2020-ESSEX COUNTY-022	Essex County Bridges	1	1	1	1	1	0	1	1	1	1	1	1	1	0	12	High
2020-ESSEX COUNTY-023	Dam Deficiencies	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	12

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.1-15. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise	-004, -010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Coastal Storm	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -014, -022	-003, -006, -013, -014		
Drought	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-005, -006, -013		
Earthquake	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Extreme Temperature	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Flood	-004, -010, -019, -020, -023	-006, -013, -022, -023	-008, -009	-022	-006, -008, -009, -013, -014, -022	-003, -006, -013, -014		
Geological	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Severe Weather	-004, -010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -014, -022	-003, -005, -006, -013, -014		
Severe Winter Weather	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Wildfire	-010, -011	-006, -013, -015, -022	-008, -009	-022	-006, -012, -013, -015, -022	-005, -006, -012, -013, -015		
Civil Disorder	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Cyber Attack	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Disease Outbreak	-010, -022	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Economic Collapse	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Hazardous Substances	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Utility Interruption	-010	-001, -002, -005, -006, -013, -022	-008, -009	-022	-001, -002, -005, -006, -007, -008, -009, -013, -022	-001, -002, -005, -006, -007, -013		
Terrorism	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		
Transportation Failure	-010	-006, -013, -022	-008, -009	-022	-006, -008, -009, -013, -022	-006, -013		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.



9.1.8 Staff and Local Stakeholder Involvement in Annex Development

Essex 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 County department 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 9.1-16. Contributors to the Annex

Name	Title	Method of Participation
Edward Esposito	ECSO – Captain	Reviewed annex, attended meetings, contributed to mitigation strategy
Stephanie Knox	ESCO - Detective	Reviewed annex, attended meetings, contributed to mitigation strategy
Ryan Peter	ECSO – Detective	Reviewed annex, attended meetings, contributed to mitigation strategy
Michael Capodanno	ECSO – Sergeant	Reviewed annex, attended meetings, contributed to mitigation strategy
Sanjeev Varghese	Division of Engineering – Public Works Director and County Engineer; Essex County Planning Board Member	Reviewed annex, attended meetings, contributed to mitigation strategy
Luis Rodriguez	Assistant County Engineer	Reviewed annex, attended meetings, contributed to mitigation strategy
David Antonio	Division of Planning - County Planner; Essex County Planning Board Member	Reviewed annex, attended meetings, contributed to mitigation strategy
Maya Lordo	Essex County Public Health Officer	Contributed to the capability assessment, risk assessment and mitigation strategy

ECSO = Essex County Sheriff’s Office



Action Worksheet			
Project Name:	Backup power for County facilities		
Project Number:	2020-ESSEX COUNTY-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	Several County facilities do not have backup power to provide continuity of operations during a Utility Interruption. These facilities provide essential services to Essex County and its residents.		
Action or Project Intended for Implementation			
Description of the Solution:	Obtain backup power for the following facilities: <ul style="list-style-type: none"> • Essex County K9/Bomb building – portable generator • OEM Storage/Crime Scene Facility – portable generator 		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Provide continuity of operations to the County during Utility Interruptions
Useful Life:	20 years	Goals Met:	2, 6
Estimated Cost:	\$100,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	Essex County Sheriff's Office	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; not feasible for all facilities
	Install wind turbine	\$20,000	Weather dependent; need open space 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 for County facilities	
Project Number:	2020-ESSEX COUNTY-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow buildings to function during a Utility Interruption
Cost-Effectiveness	1	Benefits of project outweigh the costs
Technical	1	Project is technically feasible and meets the goals of the 2020 HMP
Political	1	
Legal	1	The county has legal authority to implement this project
Fiscal	1	Need funding to complete project
Environmental	0	No negative impacts on the environment
Social	1	No negative impacts on the population
Administrative	1	
Multi-Hazard	1	Utility Interruption and hazard events that lead to Utility Interruptions
Timeline	1	To be completed within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Essex County Traffic Control Transfer Switch generator		
Project Number:	2020-ESSEX COUNTY-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Essex County traffic control transfer switch does not have backup power. During a Utility Interruption, this system cannot function properly and can create a transportation hazard for County personnel and residents.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase a portable generator to use during a Utility Interruption to operate the County's traffic control transfer switch.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Allow transfer switch to operate during Utility Interruptions
Useful Life:	20 years	Goals Met:	2, 6
Estimated Cost:	\$100,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	Essex County Sheriff's Office	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 panel at switch	\$10,000	Weather dependent; not ideal for this type of project
	Install wind turbine	\$10,000	Weather dependent; need open space 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:	Essex County Traffic Control Transfer Switch generator	
Project Number:	2020-ESSEX COUNTY-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow transfer switch to function during Utility Interruption
Cost-Effectiveness	1	Benefits of project outweigh the costs
Technical	1	Project is technically feasible and meets the goals of the 2020 HMP
Political	1	
Legal	1	The county has legal authority to implement this project
Fiscal	1	Need funding to complete project
Environmental	0	No negative impacts on the environment
Social	1	No negative impacts on the population
Administrative	1	
Multi-Hazard	1	Utility Interruption and hazard events that lead to Utility Interruptions
Timeline	1	To be completed within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Evaluate drainage systems in Essex County		
Project Number:	2020-ESSEX COUNTY-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Coastal Storm, Severe Weather, flood		
Description of the Problem:	The drainage systems in the area of Passaic Avenue and Bloomfield Avenue in Verona and JFK Parkway in South Orange become overwhelmed during heavy rain events, leading to flooding of roadways and surrounding properties. This results in road closures, restricting access to these sections of the County.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a study to evaluate drainage systems on roadways to reduce the impacts of flooding. The systems include: Passaic Avenue and Bloomfield Avenue in Verona and JFK Parkway in South Orange.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Identifies options to alleviate the drainage problems
Useful Life:	50 years	Goals Met:	1, 2
Estimated Cost:	\$100,000	Mitigation Action Type:	LPR
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 1 year of receiving funds
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FEMA PDM and HMGP, County Budget
Responsible Organization:	County Engineering Office, Essex County Sheriff's Office	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 all structures in the area	\$1 million+	Too costly; not all structures can be elevated
	Acquire all structures	\$1 million+	Too costly; lose 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:	Evaluate drainage systems in Essex County	
Project Number:	2020-ESSEX COUNTY-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Benefits of project outweigh the costs
Technical	1	Project is technically feasible and meets the goals of the 2020 HMP
Political	1	
Legal	1	
Fiscal	0	Need funding to complete project
Environmental	1	No negative impacts on the environment
Social	0	No negative impacts on the population
Administrative	0	
Multi-Hazard	1	Coastal Storm, Severe Weather, flood
Timeline	0	5 years
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Install quick-connects for emergency generators at eight County fueling stations		
Project Number:	2020-ESSEX COUNTY-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	There are eight fueling stations in Essex County. The stations use generators in the event of a Utility Interruption but the fuel pumps need to be hard wired in order to work properly.		
Action or Project Intended for Implementation			
Description of the Solution:	Install a quick connect system at the fueling stations to allow generators to run the fuel pumps when needed.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Allows portable generators to be used to run fueling stations; provides fuel for emergency vehicles during Utility Interruptions
Useful Life:	10 years	Goals Met:	1, 2, 6
Estimated Cost:	\$10,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	UASI, FEMA HMGP and PDM
Responsible Organization:	County Engineering Office	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; not feasible for all facilities; still require a connection to the pumps
	Install wind turbine	\$20,000	Weather dependent; need open space 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:	Install quick-connects for emergency generators at eight County fueling stations	
Project Number:	2020-ESSEX COUNTY-007	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Allows county vehicles to operate during Utility Interruptions and provide emergency services to residents
Property Protection	1	
Cost-Effectiveness	1	Benefits of project outweigh the costs
Technical	1	Project is technically feasible and meets the goals of the 2020 HMP
Political	1	
Legal	1	
Fiscal	0	Need funding to complete project
Environmental	1	No negative impacts on the environment
Social	1	No negative impacts on the population
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	0	To be completed within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



TOWNSHIP OF BELLEVILLE

MUNICIPALITY AT A GLANCE

Total Population: **36,383**

Total Land Area: **3.4 sq mi**

Total # Buildings: **7,910**



1% Annual Chance Flood



716

Population Residing in Floodplain



88

Persons That May Seek Shelter

100-Year MRP Event Wind Loss



\$3.4 Million

Potential Building Damages



\$28.2 Million

Potential Building Damages



3

Critical Facilities in Floodplain

NFIP Statistics



376 # NFIP Policies

32 # RL NFIP Properties

3 # SRL NFIP Properties

Hurricane Storm Surge: Category 1



92

Population Located in Category 1 SLOSH



19

Buildings Located in Category 1 SLOSH

Mitigation Action Plan (2020-2025)



Hazards

All Natural and Non-Natural Hazards

Project Types

Property Protection, Public Education/Awareness, Natural Resource Protection, Emergency Services, Structural Projects

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9.2 TOWNSHIP OF BELLEVILLE

This section presents the jurisdictional annex for the Township of Belleville. The annex includes a general overview of the Township; an assessment of the Township’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 Township of Belleville’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: Martin Lutz, Deputy Fire Chief / OEM Coordinator Address: Fire Department Headquarters - 275 Franklin Avenue, Belleville, NJ 07109 Phone Number: 973-202-1355 / 973-450-3368 Email: mlutz@bellevillefiredept.org	Name / Title: Nick Breiner, Deputy Coordinator / Police Dept. Address: Public Safety Building - 152 Washington Avenue, Belleville, NJ 07109 Phone Number: 973-930-6024 / 973-450-3333 Email: nbreiner@bellevillenj.org
NFIP Floodplain Administrator	
Name / Title: Frank Delorenzo, Construction Code Official Address: 152 Washington Avenue, Belleville, NJ 07109 Phone Number: 973-450-3410 Email: fdelorenzo@bellevillenj.net	

9.2.2 Jurisdiction Profile

The Township of Belleville is located along the Passaic River in northeastern Essex County. Bordered by Nutley Township to the north, the Passaic River and Bergen County (the Borough of North Arlington and Town of Kearny) to the east, the City of Newark to the south, and Bloomfield Township to the west.

The Township was formed as a township in 1839, with a population of only 500. It became a city in 1874 and again became a township in 1876. Belleville became a town in 1910 but reverted to township in 1981 to gain a larger share of federal revenue sharing funds.

According to the U.S. Census, the 2010 population for the Township of Belleville was 35,926. The estimated 2017 population was 36,383, a 1.3 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 12.6 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.

9.2.3 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. Table 9.2-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.2-1 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.





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	0	2	0	1	1
Multi-Family	2	8	3	3	5
Other (commercial, mixed-use, etc.)	0	1	0	1	3
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Storage Center	commercial	1	11 Franklin	n/a	building
Hospital/Clara	Addition pediatrics and ER	1	1 Franklin Ave	n/a	building
Empire Medical	doc offices		69 Academy	n/a	building
520 Belleville	apts/retail	215	520 Belleville	n/a	building
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Sound Development	mixed use/comm	56 units & retail	548-568 Franklin Avenue	n/a	currently demo of site
Terry Lofts	multi fam	115	91 Terry Street	n/a	Approved by PB
630-666 Washington	mixed use/comm	215 units & retail	9101/9	n/a	approved by PB
Bridge Development	warehouse	1	675 Main St	n/a	Before PB 11/14/19
Phase II Senior Building	residential	24 units	608 Mill Street	n/a	permit in review
Wawa	store & gas station	1 store & gas pumps	11 Franklin Ave	n/a	Permits ready for pick up
Silver Lake Village	res. & retail	~200	81-179 Belmont	n/a	approved by PB

* Only location-specific hazard zones or vulnerabilities identified.

PB = Planning Board

9.2.4 Capability Assessment

The Township of Belleville 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.





Areas that mitigation is currently integrated are summarized in this section. The Township of Belleville identified specific integration activities that will be incorporated into municipal procedures in the updated mitigation strategy. Refer to Appendix X for the results of the planning/policy document review and the answers to integration survey questions.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Township of Belleville and where hazard mitigation has been integrated.

Table 9.2-3. 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	Yes	Yes	-
<i>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. Chapter 12 (9/14/10) of the Township code. The Department of Planning and Development enforces the Building Code. In Chapter 12, Section 11 of the code, it states that certificates identifying flood hazard areas be provided upon request for various properties in the Township. The Engineering Department is responsible for providing the certificates.</i>					
Zoning Code	Yes	Local	Yes	Yes	-
<i>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 23 (6/12/07) of the Township code. The Board of Adjustment Governing Body enforces the Zoning Code. In Section 8.12 of the code, it states that exterior basement windows and doors must be at least 12 inches above the adjacent ground level to prevent flood water, melting snow, etc. from entering the basement. The Township prohibits multi-family residences, townhouses, and garden apartments within 100-year floodplains (Section 18.6).</i>					
Subdivisions	Yes	Local	Yes	No	No
<i>Comment: Chapter 18 (4/27/76) of the Township code. Planning Board and Governing Body enforces 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.</i>					
Stormwater Management	Yes	Local	Yes	Yes	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 30, 5/8/2007 of the Township code; Planning Board enforces. The Township has identified minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
<i>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.</i>					
Growth Management	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: State mandated at local level; Chapter 18 Etseq, 4/27/1976 of the Township code; enforced by Planning Board and Governing Body</i>					



	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	-	Yes	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes/No	Yes	-
<i>Comment: Chapter 20, 4/27/1976, Updated 4/10/1991; enforced by the Planning Board. Site plans must be designed in accordance to the standards set forth in Section 1.6 of the code. This includes drainage of surface runoff in and from the development so that flooding and erosion of the property and surrounding properties is prevented.</i>					
Environmental Protection	Yes	Local	Yes	No	No
<i>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 15 (Air Pollution) which prohibits excessive emission of smoke, cinders, soot, fly ash, gases, fumes, vapors, odors, dust, and other contaminants. The code also establishes standards governing the installation, maintenance, and operation of equipment and appurtenances relating to combustion which is a source of potential source of air pollution. The Township Health Officer enforces this code. Chapter 34 (Trees) – the purpose of this code is for the preservation, protection and planting of trees aids in the stabilization of soil by the prevention of erosion and sedimentation; reduces stormwater runoff and the potential damage it may create; aids in the removal of pollutants from the air and assists in the generation of oxygen; provides a buffer and screen against noise and pollution; provides protection against severe weather; aids in the control of drainage and restoration of denuded soil subsequent to construction or grading; provides a haven for birds and other wildlife and otherwise enhances the environment; protects and increases property values; conserves and enhances the Township's physical and aesthetic appearance; and generally protects the public health and safety, as well as the general welfare.</i>					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
<i>Comment: Chapter 22, 9/11/1979, Updated 5/22/2007; enforced by the Township Engineer. The code requires a development permit if construction will be in the floodplain. All new construction and substantial improvements must be constructed with materials and utility equipment resistant to flood damage and must be constructed using methods and practices that minimize flood damage.</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: adopted 12/14/1995; updated 1/8/2009; updated and adopted by the Planning Board on January 10, 2019. The 2019 reexamination includes goals to provide adequate sanitary and storm sewers to serve Belleville residents. During the next update of the master plan, the Township will review the current HMP to see where it can be integrated as appropriate.</i>					
Capital Improvement Plan	Yes	Local	Allowed	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 #.
<p><i>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. The Township budget includes funds for capital improvements. Projects included in this portion of the budget include refurbishment/replacement of sewers, improvements to roads, and improvements and/or acquisitions of properties. These types of projects will make the Township more resilient to future hazard events such as flooding and severe weather.</i></p>					
Disaster Debris Management Plan	Yes	Local	No	Yes	-
<p><i>Comment: DPW is mobilized to address disaster debris, then Township OEM files for FEMA re-imbursments. By having a plan in place, it allows the Township to identify strategies for reusing and recycling debris, identify roles and responsibilities for debris management activities, and identify debris reduction activities for future events.</i></p>					
Floodplain or Watershed Plan	No	Local	No	Yes	-
<p><i>Comment: The Township has a Floodplain Administrator and utilizes FEMA mapping to manage the floodplain.</i></p>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes	-
<p><i>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 2019 Master Plan Reexamination includes goals related to stormwater management. The Township's site plan ordinance regulates stormwater management for development projects not subject to NJDEP stormwater management rules. The Township requires on-site stormwater management controls for new development subject to the approval of the Township Engineer.</i></p>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes	Yes
<p><i>Comment: Chapter 29 – provides requirements to: control littering in the Township; prohibit the spilling, dumping, or disposal of materials (other than stormwater) to the municipal separate storm sewer system; establish a yard waste collection and disposal program; requirements for proper handling of yard waste; requirements for the proposal disposal of pet solid waste; prohibit the feeding of unconfined wildlife in any public park or township property; and prohibit illicit connections to the municipal separate storm sewer systems. The Police Department and other municipal officials enforce this chapter of the municipal code.</i></p>					
Urban Water Management Plan	No	-	No	No	-
<p><i>Comment:</i></p>					
Habitat Conservation Plan	No	-	No	No	-
<p><i>Comment:</i></p>					
Economic Development Plan	Yes	Local	No	Yes	-
<p><i>Comment: The Township has a Redevelopment Committee which has approved or is in the process of approving several redevelopment projects which will economically benefit the Township and spur further development.</i></p>					
Shoreline Management Plan	No	-	No	No	-
<p><i>Comment:</i></p>					
Community Wildfire Protection Plan	No	-	No	No	-
<p><i>Comment:</i></p>					
Community Forest Management Plan	No	-	No	No	-
<p><i>Comment:</i></p>					
Transportation Plan	No	-	No	No	-
<p><i>Comment:</i></p>					



	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	No	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	No	-
<i>Comment:</i>					
Tourism Plan	No	-	No	No	-
<i>Comment:</i>					
Business Development Plan	No	-	No	No	-
<i>Comment:</i>					
Other	No	-	No	No	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	No
<i>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 updated on February 26, 2013.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-			
<i>Comment:</i>					
Post-Disaster Recovery Plan	Yes	Local	No	No	No
<i>Comment: EOP - 2/26/2013</i>					
Continuity of Operations Plan	Yes	Local	Yes	No	No
<i>Comment: Part of the Township's EOP</i>					
Public Health Plan	Yes	Local	Yes	No	No
<i>Comment: The Township has a full time Health Department that follows all NJ Department of Health guidelines. While a formal plan is not in place, the Health Department's website provides information on their website with regards to public health.</i>					
Other	No	-	No	No	No
<i>Comment:</i>					

Table 9.2-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Construction Code
Does your jurisdiction have the ability to track permits by hazard area?	Yes – the Township utilizes the flood maps to do this



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; however, the Township is fully developed and a majority of the development going on is re-development of existing properties

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Belleville.

Table 9.2-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Belleville Township Planning 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	Reverse 911 (Nixle), social media (Facebook and Twitter), municipal website
Maintenance program to reduce risk	Yes	Tree trimming to reduce debris after an event or taking down power lines that lead to utility outages, reducing flood risk (clearing debris), etc.
Mutual aid agreements	Yes	all surrounding communities, Essex County and UASI; the Township continues to create, enhance, and maintain mutual aid agreements for continuity of operations
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering Department
Planners or engineers with an understanding of natural hazards	Yes	Engineering Department
Staff with training in benefit/cost analysis	No	
Staff with training in green infrastructure	Yes	Engineering Department
Staff with education/knowledge/training in low impact development	Yes	Engineering Department
Surveyors	Yes	Engineering Department
Stormwater engineer	Yes	Engineering Department
Personnel skilled or trained in GIS applications	Yes	Engineering Department
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Fire Department
Grant writers	Yes	Township Manager's office
Resilience Officer	No	
Watershed planner	No	
Environmental specialist	Yes	Engineering Department



Staff/Personnel Resource	Available?	Department/Agency/Position
Other	No	

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Belleville.

Table 9.2-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Engineering Department
Capital Improvements Project Funding	Yes – Engineering Department
Authority to Levy Taxes for Specific Purposes	Yes – Tax Assessor
User Fees for Water, Sewer, Gas or Electric Service	Yes – Engineering Department
Incur Debt through General Obligation Bonds	Yes – Mayor/Council
Incur Debt through Special Tax Bonds	Yes – Mayor/Council
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes – Engineering Department
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes- Building Department & Redevelopment Committee
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 Township of Belleville.

Table 9.2-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes - police department has one but only speak on behalf of police matters; fire department does as well but only on fire matters; Township Manager for township-related information
Do you have personnel skilled or trained in website development?	Contracted consultant
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – the Township provides information on flooding in the municipality including voluntary evacuation notices to areas floodprone, information on what to do if weather forecasts predict flooding, and how to prepare for an upcoming storm
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – Facebook and Twitter – the Township provides notices, news, events, and emergency information on their social media accounts.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – Community Emergency Response Team that is administered through Belleville Police and Belleville OEM. This team is made up of volunteers who are educated on disaster preparedness for hazards that could impact Belleville and trained in basic response skills.
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes – Township newsletter and tax bills can be used to include hazard-related information
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> ▪ If yes, briefly describe. 	Yes - Reverse 911 (Nixle), social media (Facebook and Twitter), municipal website

COMMUNITY CLASSIFICATIONS





The table below summarizes the classifications for community programs available to the Township of Belleville.

Table 9.2-8. 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; starting the process (August 2019) to get a better classification	2012
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No; however, the Township passed a resolution that supports participation in the program	-	-

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? 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? No

Table 9.2-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storm (Hurricane, Tropical Storm, Nor'Easter)	Medium
Drought	Medium
Earthquake	Low
Extreme Temperature	High
Flood	High
Geological hazards (landslide, subsidence, sinkholes)	Low
Severe Weather	High
Severe Winter Weather	High
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Disease Outbreak (West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus)	Medium
Economic Collapse (new)	Low
Hazardous Substances	High
Utility Interruption	High
Terrorism	Medium
Transportation Failure (vehicular accidents, aviation accidents, railway failures and accidents, roadway and bridge failures)	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 9.2-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Code and Engineering
Who is your floodplain administrator? (name, department/position)	Construction Code 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?	Insert appropriate information
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> ▪ If exceeds, in what ways? 	Meets the minimum requirement
When was the most recent Community Assistance Visit or Community Assistance Contact?	The most recent CAC was conducted on 6/11/2018.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> ▪ If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> ▪ If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> ▪ If no, state why. 	Yes - the most recent maps are accurate
Does your floodplain management staff need any assistance or training to support its floodplain management program? <ul style="list-style-type: none"> ▪ If so, what type of assistance/training is needed? 	Yes - training and assistance is always welcome Any type of flood-related training
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> ▪ 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?*	374
<ul style="list-style-type: none"> • What is the insurance in force? • What is the premium in force? 	\$48,955,000 \$273,504
How many total loss claims have been filed in your jurisdiction?*	182
<ul style="list-style-type: none"> • How many claims are still open or were closed without payment? • What were the total payments for losses? 	22 closed without payment (as of 9/30/18) \$6,932,839
Do you maintain a list of properties that have been damaged by flooding?	No





Criterion	Response
Do you maintain a list of property owners interested in flood mitigation?	No – property owners have not approached the Township with regards to mitigating their properties

*According to FEMA statistics as of July 31, 2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

- The Township maintains the sanitary sewer system by clearing snags and debris. This helps reduce the probability of flooding during periods of heavy rain.
- The municipal website provides information on road closures, news and events, and other official notices. This provides residents with important information during a hazard event such as flooding and winter storms.
- Areas along Rutgers Avenue and Belleville Avenue have steep slopes. The Township requires retaining walls be installed as development occurs in order to reduce or eliminate risks associated with landslides or falling rocks.
- Fire Protection Upgrades - The Township is constantly upgrading water mains, hydrants, and valves. However, the Township would like to complete an asset management plan to get an understanding of what upgrades work, what does not work, and what needs to be upgraded.

9.2.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Belleville’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County; refer to Appendix E (Risk Assessment Supplement). Table 9.2-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.2-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm FEMA-DR-4264	Yes	<p>Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.</p> <p>Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. Bridges and tunnels from New York City into New Jersey were shut down by mid-afternoon Saturday.</p> <p>At Newark Airport, the storm total snowfall was 24.5 inches, where winds</p>	\$100,300



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.	
July 14, 2016	Thunderstorm / Wind	N/A	An approaching trough of low pressure triggered a line of strong to severe storms that moved across Northeast New Jersey. A tree fell down on a house along Mohawk Drive about 1 mile northeast of Livingston. \$5K in property damages were reported. A large tree snapped and landed on a car on Maple Street just east of West Orange. \$7.5K in property damages were reported. A large tree snapped and fell on a fence between West Orange and Glen Ridge. \$2K in property damages were reported. A tree fell on a car along Branch Brook Drive just west of Belleville. \$6K in property damages were reported.	\$18,800
July 3, 2018	Thunderstorm / Wind	N/A	A pre-frontal trough ahead of an approaching cold front triggered strong to severe thunderstorms across the region. A tree on car with people trapped inside at the intersection of Main Street and Rutgers Street in Belleville. \$5K in property damages were reported. A tree fell down on a car at the intersection of Orange Street and 4th Street in Roseville. \$5K in property damages were reported.	\$20,000

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 9.2-12 summarizes the Township of Belleville’s risk assessment results and data used to determine the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 9.2-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion Hazard Area (CEHA):	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	92	Category 1:	19	100-year Wind Loss:	\$3,381,110	High
		Category 2:	951	Category 2:	197			
	Category 1 through Category 4 SLOSH	Category 3:	2,229	Category 3:	462	500-year Wind Loss:	\$16,934,187	
		Category 4:	2,595	Category 4:	533			
Drought	Drought event	Majority of the County is serviced by water suppliers with surface water sources.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	2,368	NEHRP D&E:	504	100-year Loss:	\$0	High
		Liquefaction Class 4:	179	Liquefaction Class 4:	37	500-year Loss:	\$4,616,521	
						2,500-year Loss:	\$71,094,612	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,600	Physical impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or Utility interruptions.		Low
		Population Below Poverty Level:	3,515					
Flood	100- and 500-Year Mean Return Period Event	100-year	716	100-year	152	100-year Loss:	\$28,159,334	High
		500-year	1,606	500-year	340			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	5	Class B:	1	Class B:	\$359,884	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Severe Winter Weather	Severe Winter 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.	The cost of snow and ice removal and repair of roads can impact local operating budgets.	Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire: 0	Wildfire: 0	Wildfire: \$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.	Buildings in the immediate vicinity will be most impacted.	Economic assets in the immediate vicinity will be most impacted.	Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.	Damages due to a cyber-attack may be limited.	The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.	Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident	Disease outbreak would not have a direct impact on buildings.	Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.	Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run-down.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Belleville.

- Number of repetitive loss (RL) properties: 32
Number of severe repetitive loss (SRL) properties: 6
Number of RL/SRL properties that have been mitigated : 0

Note: RL and SRL as of 03/31/2019

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines located in the 1-percent and 0.2-percent annual chance floodplains and presents a mitigation action, if appropriate.

Table 9.2-13. Potential Flood Losses to Critical Facilities and Lifelines

Table with 5 columns: Name, Type, Exposure (1% Event, 0.2% Event), Status of Mitigation. Rows include Food Basics* and Sahay Getty Station*.

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

- The Fairway Avenue area and the Valley section of the Township are vulnerable to flooding during periods of heavy rain. This leads to flooding of roadways, homes, and businesses. A mitigation action has been identified to address this vulnerability and included in Table 9.2-16 as 2020-BELLEVILLE-003.
Third River flows through the Township and floods the sanitary sewer system. The Township maintains the system by clearing snags and debris, but it has not alleviated the problem. A mitigation action has been identified to address this vulnerability and included in Table 9.2-16 as 2020-BELLEVILLE-005.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Belleville 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 Belleville has significant exposure. A map of the Township of Belleville hazard area extent and location is provided at the end of this annex. This map also displays the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 (Risk Assessment) of the plan. 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 (adaptive capacity) and changing future climate





conditions. This input supports the mitigation action development to target those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of hazard risk exposure and vulnerability compared to Essex 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 for the Township of Belleville. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Belleville has reviewed the Essex 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:

- Adjusted the calculated risk ranking for: Coastal Erosion and Sea Level Rise (from low to medium), Flood (from low to medium), Hazardous Substances (from low to medium), and Utility Interruption (from high to medium). These adjustments were made based on the geographic location of the Township and the history of events and their impacts on the community.

Table 9.2-14. Township of Belleville Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Medium	Medium	Medium	Low	Medium	Medium

Geological Hazards	Severe Weather	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Medium	Medium	Low	Low

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 9.2-15. 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 #
Belleville-1	Belleville Township Fairway Avenue flood mitigation.	Engineering Department	No Progress - keep in the plan because every time there are heavy rains, it floods, the river and the golf course water flow to this area and flood homes; there is also a pump station that gets inundated and unable to function properly	X	2020-BELLEVILLE-003
Belleville-2	Belleville Township shelter generators.	Office of Emergency Management	Complete		
Belleville-3	Belleville Township fire headquarters generator.	Office of Emergency Management	Complete		
Belleville-4	Belleville Township Town Hall and Public Works generator.	Office of Emergency Management	Complete		
Belleville-5	Emergency services and emergency shelter generator	Engineering Department	Complete		
Belleville-6	Main Street flooding, entire length, Newark to Nutley borders	Engineering Department	In Progress - receive funding for this and meeting the NJEDA to do this; FEMA HMGP and EDA funds to complete project	X	2020-BELLEVILLE-004
Belleville-7	Flood Study of Third River to address problems with sanitary sewers during flood events. Funding has been applied for and pending award.	County, Belleville, Nutley, Bloomfield Engineering and OEM	Some work has been done; ongoing capability to clear snags, etc. but a full study has not been conducted	X	2020-BELLEVILLE-005
Belleville-9	Steep Slopes at Rutgers Ave. and Belleville Ave. – Private property owners are adding retaining walls as required for development.	Township of Belleville	Ongoing Capability		
Belleville-10	Fire Protection Upgrades – Water Main Upgrades; Hydrant and Valve Replacement.	Township of Belleville	Ongoing Capability - constantly upgrading when possible; would like to do an asset management plan to get an idea of what works, what doesn't, and what needs to be upgraded		
Belleville-11	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.	Township of Belleville NFIP FPA	Main Street and Fairway area are the only two areas that flood; once they complete the Main Street flood mitigation project -	X	2020-BELLEVILLE-006, 2020-



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 #
			full moon, high tides are the events that cause the most damage		BELLEVILLE-005
Belleville-12	Utilize the HMP to include hazard mitigation in the next Master Plan update.	Township of Belleville	Ongoing Capability		
Belleville-13	<p>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 may include:</p> <ul style="list-style-type: none"> • 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 Town/Village 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 in the annual newsletter. 	Supervisor's Office	Ongoing Capability		
Belleville-14	Continue the existing tree maintenance program	Engineering and DPW; Working with contractors and utilities as needed	Ongoing Capability - tree maintenance done as needed; during road program, the township will remove trees that are ripping up curbing, sidewalk, etc. and plant new trees		
Belleville-15	Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Township of Belleville	Ongoing Capability		



In addition to the above progress, the Township of Belleville 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 Township of Belleville participated in a risk assessment workshop on September 19, 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Belleville participated in a mitigation action workshop on October 24, 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; public input 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.2-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Belleville 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.2-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.2-18 presents a summary analysis of the identified mitigation action types identified across hazards of concern.



Table 9.2-16. 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-BELLEVILLE-001	Critical facility – Food Basics	Problem: Food Basics, located at 414 Main Street in Belleville, is identified as a lifeline and located in the 1% and 0.2% annual chance flood area. This facility is at-risk to flood damages.	Solution: While the Township does not own this facility, it is identified as essential during a hazard event. The Township will notify the property owner/operator that their facility is located in the floodplain and provide mitigation options to protect the structure from future flood events and damages.	Existing	Flood	1, 2, 3, 6	Belleville Emergency Management	Municipal Budget	Increase knowledge of facility owners; provides outreach	<\$5,000	Within 1 year	Medium	EAP	PI
2020-BELLEVILLE-002	Critical facility – Sahay Getty Station	Problem: Sahay Getty Station, located at 437 Main Street in Belleville, is identified as a lifeline and located in the 1% and 0.2% annual chance flood area. This facility is at-risk to flood damages.	Solution: While the Township does not own this facility, it is identified as essential during a hazard event. The Township will notify the property owner/operator that their facility is located in the floodplain and provide mitigation options to protect the structure from future flood events and damages.	Existing	Flood	1, 2, 3, 6	Belleville Emergency Management	Municipal Budget	Increase knowledge of facility owners; provides outreach	<\$5,000	Within 1 year	Medium	EAP	PI
2020-BELLEVILLE-003 (previous action Belleville-1)	Fairway Avenue Study and Implementation	Problem: Areas along Fairway Avenue are prone to flooding during heavy rain events. The river and golf course water flow to this area and flood homes. There is also a pump station that		New	Flood, Severe Weather, Coastal Storm	1, 2, 6	Belleville Emergency Management, Floodplain Administrator	FEMA PDM for study; FEMA FMA for implementation	Identifies the cause of flooding and identifies potential	\$6.5M	3 to 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
		becomes inundated and cannot function properly.	Solution: This will be a phased approach: Conduct a study of the area to determine why this area continues to flood. Educate residents that their property is identified as RL or SRL and provide them mitigation options Investigate pump station to determine if needs to be repaired for replaced.						solutions to alleviate flood damage					
2020-BELLEVILLE-004 (previous action Belleville-6 and 11)	Main Street flooding, entire length, Newark to Nutley borders	Problem: The entire length of Main Street in the Township is prone to flooding. The Township has received funds from NJEDA; however, additional funding is needed to complete.	Solution: Installation of check valves on the Route 21 drainage outfalls.	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 6	Engineering Department	FEMA HMGP and NJEDA	Identifies the cause of flooding and provides projects that can alleviate the flooding	\$300,000	Within 5 years	High	SIP	PP
2020-BELLEVILLE-005 (previous action Belleville-7 and 11)	Flood Study of Third River	Problem: Third River flows through the Township and floods the sanitary sewer system. While the Township maintains the system by clearing snags and debris, it has not alleviated the problem.	Solution: Conduct a study of Third River to determine the cause of flooding and identify actions to reduce or alleviate flooding associated with Third River in the Township.	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 6	Engineering Department	FEMA PDM, Municipal Budget	Identifies the cause of flooding and provides projects that can alleviate the flooding	\$100,000	Within 5 years	High	NSP, EAP	PP, NR
2020-BELLEVILLE-006	RL/SRL Properties in the Valley Section of Belleville Township	Problem: Frequent flooding events have resulted in damages in the Valley Section of the Township. This includes Little Street, Main Street, Roosevelt		Existing	Flood, Severe Weather	1, 2, 3	Emergency Management, Floodplain Administrator	Municipal budget for outreach, FEMA HMGP and FMA for mitigation	Eliminates flood damage to homes and residents,	<\$5,000 for outreach; \$5 million	Three years	High	SIP, EAP	PP, 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
		Ave., Mill Street, Cortlandt St., and Davidson Ave. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. If not mitigated, these structures will continue to be damaged by flood events.							creates open space	for mitigation				
			Solution: Conduct outreach to 24 floodprone property owners, including RL/SRL properties, 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 mitigation of residential homes in the Valley section of the Township.											
2020-BELLEVILLE-007	Public Education and Outreach	Problem: The current municipal website does not contain detailed information on what residents can do to be protected from hazard events and what they can do to be safe before, during, and after events.	Solution: Develop materials related to hazard mitigation and preparedness for residents. The information will include what to do during a power outage, driving in winter weather, floodprone areas in the Township, etc. The materials will be available on the municipal website and social media accounts and will be provided in other languages.	Existing	All	1, 2, 3	Belleville Emergency Management	Municipal Budget	Increases outreach to community	Staff Time	Within 2 years	Medium	EAP	PI, 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 9.2-17. 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-BELLEVILLE-001	Critical facility – Food Basics	1	1	1	1	1	0	1	0	0	1	0	1	0	0	8	Medium
2020-BELLEVILLE-002	Critical facility – Sahay Getty Station	1	1	1	1	1	0	1	0	0	1	0	1	0	0	8	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-BELLEVILLE-003 (previous action Belleville-1)	Fairway Avenue Study and Implementation	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-BELLEVILLE-004 (previous action Belleville-6 and 11)	Main Street flooding, entire length, Newark to Nutley borders	1	1	1	1	1	0	0	1	1	1	1	1	1	0	11	High
2020-BELLEVILLE-005 (previous action Belleville-7 and 11)	Flood Study of Third River	1	1	1	1	1	0	0	1	1	1	1	1	1	0	11	High
2020-BELLEVILLE-006	RL/SRL Properties in the Valley Section of Belleville Township	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-BELLEVILLE-007	Public Education and Outreach	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 9.2-18. 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 Erosion and Sea Level Rise			-007		-007			
Coastal Storm		-004, -005	-005, -006, -007	-005	-007	-004, -006		
Drought			-007		-007			
Earthquake			-007		-007			
Extreme Temperature			-007		-007			
Flood			-001, -002, -007		-007	-003, -004		
Geological hazards			-007		-007			
Severe Weather			-007		-007	-004		
Severe Winter Weather			-007		-007			
Wildfire			-007		-007			
Civil Disorder			-007		-007			
Cyber Attack			-007		-007			
Disease Outbreak			-007		-007			
Economic Collapse			-007		-007			
Hazardous Substances			-007		-007			
Utility Interruption			-007		-007			
Terrorism			-007		-007			
Transportation Failure			-007		-007			

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 Township of Belleville 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 actively participated and in what capacity. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.2-19. Contributors to the Annex

Entity	Title	Method of Participation
Martin Lutz	Deputy Fire Chief, OEM Coordinator	Primary POC, reviewed annex, attended meetings, contributed to the mitigation strategy
Nick Breiner	Deputy OEM Coordinator	Steering Committee member, alternate POC, reviewed annex, attended meetings, contributed to the mitigation strategy



Figure 9.2-1. Township of Belleville Hazard Area Extent and Location Map

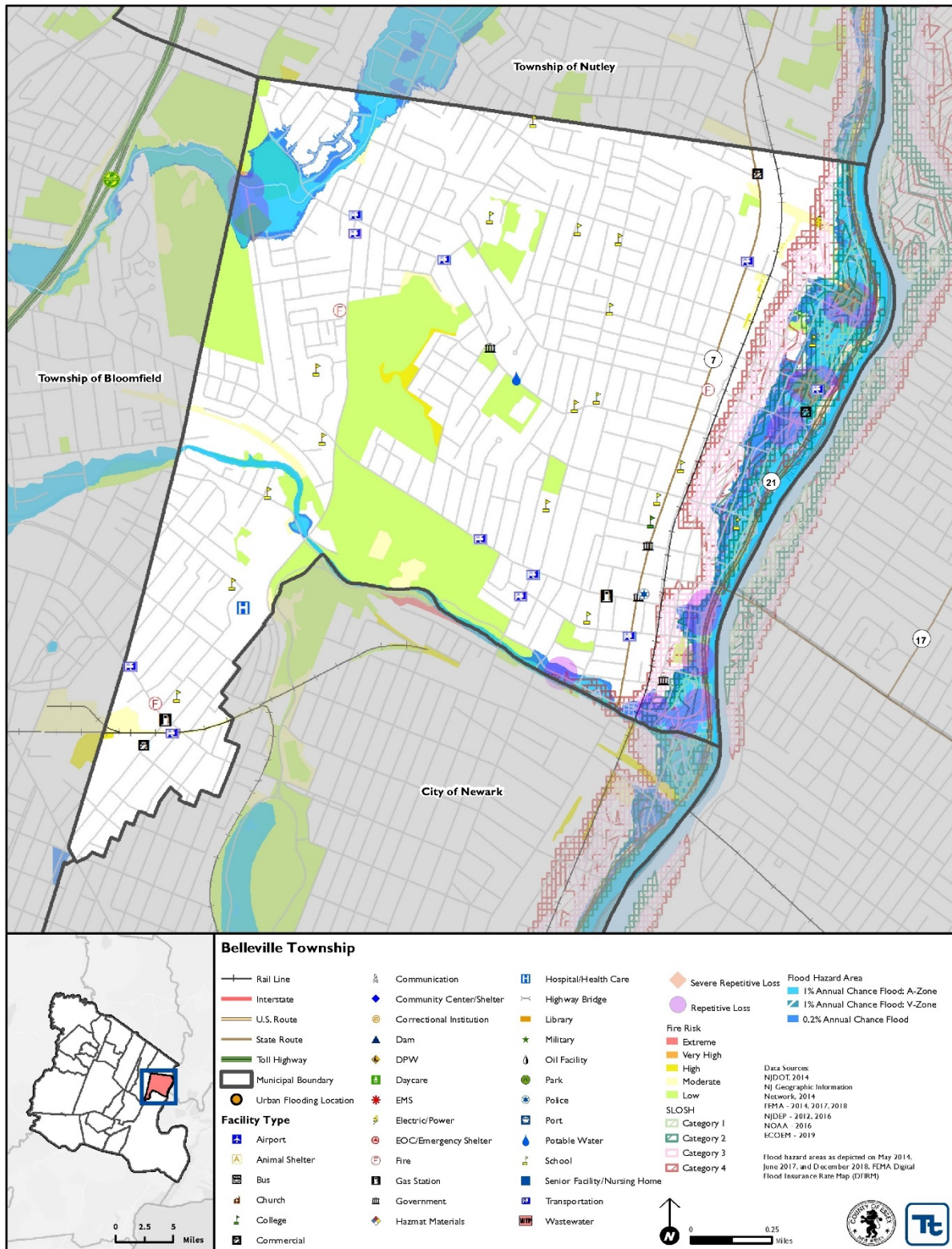
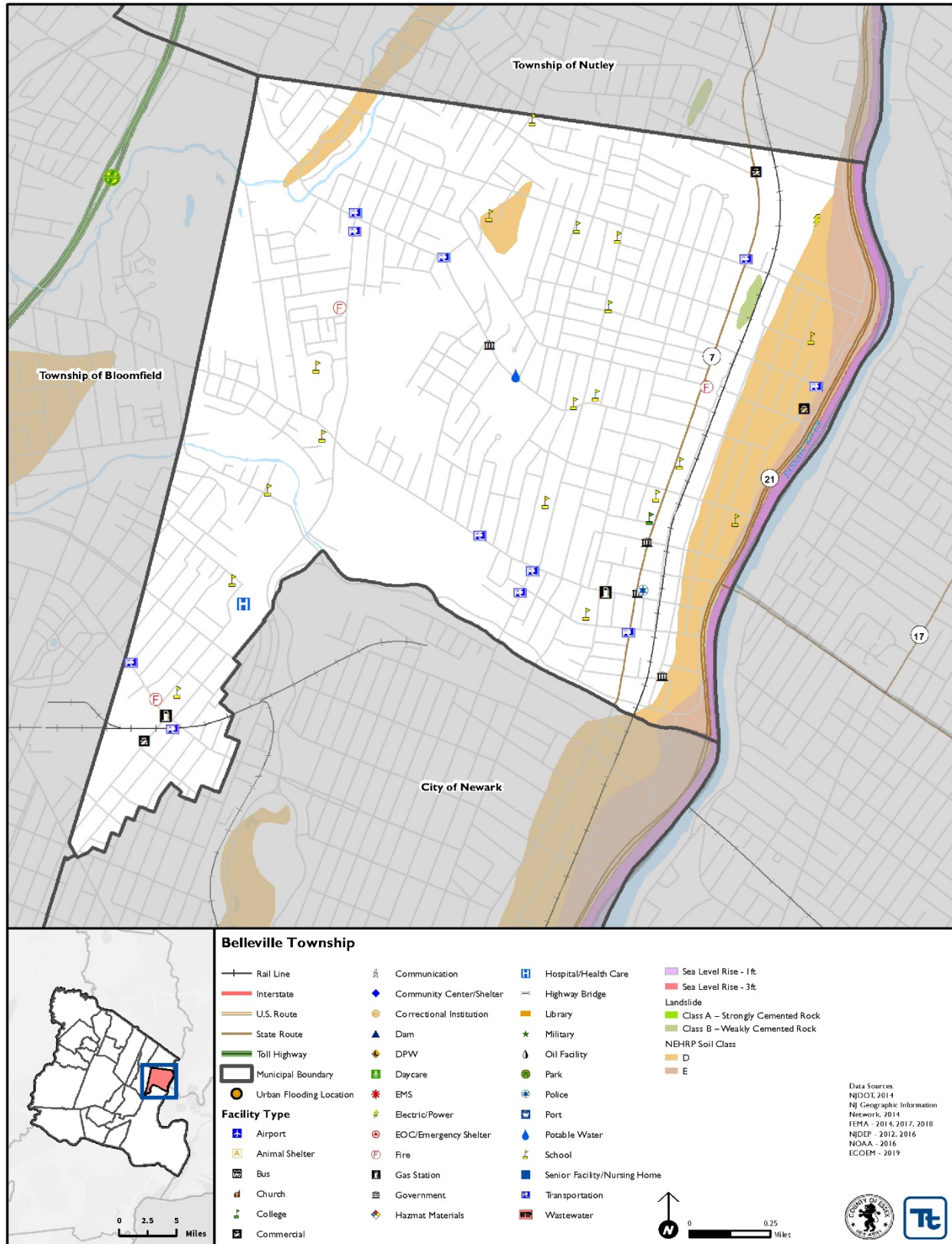




Figure 9.2-2. Township of Belleville Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Fairway Avenue Study and Implementation		
Project Number:	2020-BELLEVILLE-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm		
Description of the Problem:	Areas along Fairway Avenue are prone to flooding during heavy rain events. The river and golf course water flow to this area and flood homes. There is also a pump station that becomes inundated and cannot function properly.		
Action or Project Intended for Implementation			
Description of the Solution:	This will be a phased approach: <ol style="list-style-type: none"> 1. Conduct a study of the area to determine why this area continues to flood. 2. Educate residents that their property is identified as RL or SRL and provide them mitigation options 3. Investigate pump station to determine if needs to be repaired for replaced. 		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Identifies the cause of flooding and identifies potential solutions to alleviate flood damage
Useful Life:	50 years	Goals Met:	1, 2, 6
Estimated Cost:	\$500,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	3-5 years	Potential Funding Sources:	FEMA PDM for study; FEMA FMA for implementation
Responsible Organization:	Belleville Emergency Management, Floodplain 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
	Acquire all properties in this section of the Township	\$6 million	Too costly, Township will lose tax base, homeowners and business owners might not want to move
	Regrade golf course	\$10 million	While the golf course is one of the main issues of flooding, it is too costly and not a permanent solution for this problem
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Fairway Avenue Study and Implementation	
Project Number:	2020-BELLEVILLE-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Relocate residents for safety
Property Protection	1	Protect properties from floods
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	It is technically feasible
Political	1	There is political support for this project
Legal	1	Township has authority to conduct the study and work
Fiscal	0	Requires grant funding
Environmental	1	
Social	0	Project would require several homes to relocate
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather, Coastal Storm
Timeline	0	To be completed within 5 years
Agency Champion	1	Homeowners and floodplain administrator support this project
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Main Street flooding, entire length, Newark to Nutley borders		
Project Number:	2020-BELLEVILLE-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm		
Description of the Problem:	The entire length of Main Street in the Township is prone to flooding. The Township has received funds from NJEDA; however, additional funding is needed to complete.		
Action or Project Intended for Implementation			
Description of the Solution:	Installation of check valves on the Route 21 drainage outfalls.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Identifies the cause of flooding and provides projects that can alleviate the flooding
Useful Life:	50 years	Goals Met:	1, 2, 6
Estimated Cost:	\$300,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	Within 5 years	Potential Funding Sources:	FEMA HMGP and NJEDA
Responsible Organization:	Engineering 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
	Acquire all properties in this section of the Township	\$6 million	Too costly, Township will lose tax base, homeowners and business owners might not want to move
	Elevate all structures	\$10 million+	Too costly, might not be necessary to elevate all structures
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Main Street flooding, entire length, Newark to Nutley borders	
Project Number:	2020-BELLEVILLE-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Increase safety of residents, reduce or eliminate those impacted by flood
Property Protection	1	Protect properties from floods
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	It is technically feasible
Political	1	There is political support for this project
Legal	1	
Fiscal	0	Requires funding
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather, Coastal Storm
Timeline	0	To be completed within 5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Flood Study of Third River		
Project Number:	2020-BELLEVILLE-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm		
Description of the Problem:	Third River flows through the Township and floods the sanitary sewer system. While the Township maintains the system by clearing snags and debris, it has not alleviated the problem.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a study of Third River to determine the cause of flooding and identify actions to reduce or alleviate flooding associated with Third River in the Township.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Identifies the cause of flooding and provides projects that can alleviate the flooding
Useful Life:	50 years	Goals Met:	1, 2, 6
Estimated Cost:	\$100,000	Mitigation Action Type:	NSP, EAP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	Within 5 years	Potential Funding Sources:	FEMA PDM, Municipal Budget
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
	Acquire all properties in this section of the Township	\$6 million	Too costly, Township will lose tax base, homeowners and business owners might not want to move
	Elevate all structures	\$10 million+	Too costly, might not be necessary to elevate all structures
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 Study of Third River	
Project Number:	2020-BELLEVILLE-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Increase safety of residents, reduce or eliminate those impacted by flood
Property Protection	1	Protect properties from floods
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	It is technically feasible
Political	1	There is political support for this project
Legal	1	
Fiscal	0	Requires funding
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather, Coastal Storm
Timeline	0	To be completed within 5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	RL/SRL Properties in the Valley Section of Belleville Township		
Project Number:	2020-BELLEVILLE-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Frequent flooding events have resulted in damages in the Valley Section of the Township. This includes Little Street, Main Street, Roosevelt Ave., Mill Street, Cortlandt St., and Davidson Ave. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. If not mitigated, these structures will continue to be damaged by flood events.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 24 floodprone property owners, including RL/SRL properties, 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 mitigation of residential homes in the Valley section of the Township.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard <i>(in accordance with the Township's flood ordinance)</i>	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, 3
Estimated Cost:	<\$5,000 for outreach; \$5 million for mitigation	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:	Municipal budget for outreach, FEMA HMGP and FMA for mitigation
Responsible Organization:	Emergency Management, 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	\$4.2 million	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:	RL/SRL Properties in the Valley Section of Belleville Township	
Project Number:	2020-BELLEVILLE-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	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 the Valley Section area of Township
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	



TOWNSHIP OF BLOOMFIELD

MUNICIPALITY AT A GLANCE

Total Population: **48,892**
 Total Land Area: **5.4 sq mi**
 Total # Buildings: **11,720**



1% Annual Chance Flood



2,312

Population Residing
in Floodplain



258

Persons That
May Seek Shelter



\$66.0 Million

Potential
Building Damages



4

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$ 4.6 Million

Potential Building Damages

NFIP Statistics



475 # NFIP
Policies

27 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural
Resource Protection, Emergency
Services, Structural Projects

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9.3 TOWNSHIP OF BLOOMFIELD

This section presents the jurisdictional annex for the Township of Bloomfield. The annex includes a general overview of the Township of Bloomfield; an assessment of the Township’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 Township of Bloomfield’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
Fred Menzel, OEM Coordinator 1 Municipal Plaza, Bloomfield, NJ 07003 (973) 418-2108 bvesfmen@aol.com	Thomas Pelsia, Deputy OEM Coordinator 1 Municipal Plaza, Bloomfield, NJ 07003 (973) 332-2855 Tbone1019@comcast.net
NFIP Floodplain Administrator	
Paul Lasek, Township Engineer 1 Municipal Plaza, Bloomfield, NJ 07003 (973) 680-4009 plasek@bloomfieldwpnj.com	

9.3.2 Jurisdiction Profile

The Township of Bloomfield was incorporated as a Township in 1812. A local Presbyterian parish which was named for the Governor of New Jersey, Joseph Bloomfield, became the name of the Township. In 1831, a local engineer, Ephriam Beach, increased commerce to the area by designing the inclined planes of the Morris Canal. In 1981, Bloomfield residents adopted the Township form of government. The Township is governed by a mayor and six-member town council.

The Township covers approximately 5.3 square miles and located in northeastern Essex County. It is bordered by Belleville, Newark and Nutley to the east; Glen Ridge and Montclair to the west; Clifton to the north and East Orange to the south.

According to the U.S. Census, the 2010 population for the Township of Bloomfield was 47,315. The estimated 2017 population was 48,892, a 3.3 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.2 percent of the population is 5 years of age or younger and 13.5 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 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

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	-	-	-	-	-
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Bloomfield Center Redevelopment	Mixed Use		Downtown Bloomfield - Blocks 153, 220, 225, 226, 227, 228, 241, 242, 243, 244, 253, 255, 301, 302, and 311	No	In Progress
Green at Bloomfield	Mixed Use	140-unit building	Corner of Liberty and Broad Streets (Block 242, Lots 13, 25, 27, 28, 30, 31, 32, 37 and 38)	No	In Progress
Bloomfield College	Mixed Use	1 building	Franklin and Broad Streets	No	Complete
Hartz Mountain Redevelopment	Residential	336-unit building	192 Grove Street	No	Complete
Oakes Pond at Bloomfield	Residential	331-unit building	40 Memorial Parkway	No	Complete
Watsessing Avenue Redevelopment	Mixed Use	1 building – retail space and 24 residential units	59 Dodd Street	No	In Progress
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None identified					

* Only location-specific hazard zones or vulnerabilities identified.

9.3.4 Capability Assessment

The Township of Bloomfield 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.

Areas that mitigation is currently integrated are summarized in this subsection. The Township of Bloomfield 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 Bloomfield and where hazard mitigation has been integrated.

Table 9.3-3. 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 and State	Yes	No	-
<i>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. Chapter 149 (June 1, 2009) of the Township Code; enforced by the construction department</i>					
Zoning Code	Yes	Local and State	Yes	Yes	-
<i>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 149 (June 1, 2009) of the Township Code; enforced by planning and zoning; Chapter 315 (Land Development) was adopted by Bloomfield Council on 7/25/2005 and amended on 12/3/2007. It was adopted pursuant to the MLUL. The Township requires an environmental impact assessment when a 25% or more of the property is within or borders a floodplain or a 25% or more of the property has a grade of 15% or more. Site plan reviews look for many items including the protection of land within floodplains or flood zones.</i>					
Subdivisions	Yes	Local and State	Yes	Yes	-
<i>Comment: 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 149 (June 1, 2009) of the Township Code; enforced by planning and zoning; Chapter 315 (Land Development) was adopted by Bloomfield Council on 7/25/2005 and amended on 12/3/2007. It was adopted pursuant to the MLUL. This chapter also includes regulations for subdivisions.</i>					
Stormwater Management	Yes	Local	Yes	Yes	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8); Chapter 494 (2010) of the Township code; enforced by engineering. The purpose of Chapter 494 is to establish minimum stormwater management requirements and controls for major development in the Township. Structural stormwater management measures must be designed to take into account existing site conditions including environmentally critical areas, wetlands, floodprone areas, slopes, depth to seasonal high water table, soil type, permeability and texture, drainage area and drainage patterns, and the presence of solution-prone carbonate rocks.</i>					
Post-Disaster Recovery	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 #.
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
<i>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.</i>					
Growth Management	-		Yes	Yes/No	Yes/No
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	No
<i>Comment: Chapter 149 (2012); conducted by planning and zoning; Chapter 315 (Land Development) was adopted by Bloomfield Council on 7/25/2005 and amended on 12/3/2007. It was adopted pursuant to the MLUL. This chapter also includes information on site plan review.</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	Yes	-
<i>Comment: Chapter 250 (2002); enforced by engineering. The chapter has specific standards for all areas of special flood hazard where base flood elevation data has been provided. Any development in the special flood hazard area must apply for a development permit before any construction begins. The standards include any new residential construction and substantial development require the lowest floor, including basement, to be elevated to or above the base flood elevation. If in AO zones, the lowest floor, including basement, must be elevated above the highest adjacent grade at least as high as the depth number specified in feet (at least two feet if no depth number is specified). And, require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures. For non-residential construction, any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated one foot above the base flood elevation or together with the attendant utilities and sanitary facilities follow requirements set forth in Chapter 250, Section 17.</i>					
Wellhead Protection	-	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	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:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: Updated in 2012; planning and zoning are responsible for maintaining and updating. The 2012 plan was not available for review; however, the 2002 plan was reviewed. The purpose of the Conservation Plan element of the Master Plan is to preserve environmentally sensitive features, such as surface water, flood hazard areas, wetlands, steep slopes, and woodlands. This element provides information on where flood hazard areas in the Township are located and what their primary cause of flooding. The element includes information on steep slope areas. The Township compares its master plan to the County's 1998 Cross Acceptance Report and the State's Development and Redevelopment Plan.</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>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. The Township plan is dated 2013 and the finance department is the local authority.</i>					
Disaster Debris Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Floodplain or Watershed Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Stormwater Management Plan	Yes/No	Local and State	Yes	Yes/No	Yes/No
<i>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).</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes/No	Yes/No
Comment:					
Urban Water Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Habitat Conservation Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Economic Development Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Shoreline Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Community Wildfire Protection Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Community Forest Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Transportation Plan	Yes/No		No	Yes/No	Yes/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 #.
Agriculture Plan	Yes/No		No	Yes/No	Yes/No
<i>Comment:</i>					
Climate Action Plan	Yes/No		No	Yes/No	Yes/No
<i>Comment:</i>					
Tourism Plan	Yes/No		No	Yes/No	Yes/No
<i>Comment:</i>					
Business Development Plan	Yes/No		No	Yes/No	Yes/No
<i>Comment:</i>					
Other	Yes	Local	No	-	-
<i>Comment:</i> <ul style="list-style-type: none"> Tree Protection Ordinance (Chapter 535): The Township Council of the Township of Bloomfield finds that the preservation, protection and planting of trees: aids in the stabilization of soil by the prevention of erosion and sedimentation; reduces stormwater runoff and the potential damage it may create; aids in the removal of pollutants from the air and assists in the generation of oxygen; provides a buffer and screen against noise and pollution; provides protection against severe weather; aids in the control of drainage and restoration of denuded soil subsequent to construction or grading; provides a haven for birds and other wildlife and otherwise enhances the environment; protects and increases property values; conserves and enhances the Township's physical and aesthetic appearance; and generally protects the public health and safety as well as the general welfare. 					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment:</i> 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 updated in 2011; OEM is responsible for the plan.					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment:</i> Part of the Township's EOP					
Continuity of Operations Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment:</i> Part of the Township's EOP					
Public Health Plan	Yes/No		Yes/No	Yes/No	Yes/No
<i>Comment:</i>					
Other	Yes/No		Yes/No	Yes/No	Yes/No
<i>Comment:</i>					

Table 9.3-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes



Criterion	Response
- If no, who does? If yes, which department?	Large development goes through the Zoning and Planning; all permits are issued through the 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 – the Township has an open space inventory that shows areas of open space that cannot be developed; the Township is fully developed and there is no available land for new development

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Bloomfield.

Table 9.3-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Bloomfield Planning Board
Mitigation Planning Committee	Yes	LEPC
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes	Open Space Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Swift 911, municipal website, social media
Maintenance program to reduce risk	Yes	DPW – tree trimming, hydrant flushing, clearing storm drains 911 – if the 911 systems in the Township go down, they have the ability to move dispatchers to other locations
Mutual aid agreements	Yes	Fire, police, HAZMAT, EMS – surrounding communities; Essex County and UASI
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	Contracted engineers
Staff with training in benefit/cost analysis	Yes	Financial officer
Staff with training in green infrastructure	-	-
Staff with education/knowledge/training in low impact development	-	-
Surveyors	Yes	Contracted engineers
Stormwater engineer	-	-
Personnel skilled or trained in GIS applications	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Grant writers	Yes	Contracted consultant
Resilience Officer	No	-
Watershed planner	-	-
Environmental specialist	-	-
Other	No	-



FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Bloomfield.

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 – water and sewer (combined in tax bill)
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 Bloomfield.

Table 9.3-7. 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 – performed within the Township
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes – the Township uses their website to provide information on how to prepare for upcoming weather events and issue weather warnings
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes – the Township has a Facebook page and Twitter account
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 – the Township newsletter, <i>Bloomfield Buzz</i> , can be used to communicate hazard-related information
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - Swift 911, municipal website, social media

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Bloomfield.

Table 9.3-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-





Program	Participating?	Classification	Date Classified
Building Code Effectiveness Grading Schedule (BCEGS)	No; however, the Township is going through a re-evaluation of their codes and should have a BCEGS classification after the evaluation		
Public Protection (Fire ISO Protection Class)	Yes	2B	November 2010
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	10/4/2017

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.

Table 9.3-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storm (Hurricane, Tropical Storm, Nor'Easter)	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological hazards (landslide, subsidence, sinkholes)	Medium
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak (West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus)	Medium
Economic Collapse (new)	Medium
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure (vehicular accidents, aviation accidents, railway failures and accidents, roadway and bridge failures)	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 9.3-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering Department
Who is your floodplain administrator? (name, department/position)	Township 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?	May 7, 2007
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?	The most recent CAC was conducted on 6/14/2012.
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.	No – the Township feels that the current maps show more floodplains than where it actually floods in the municipality; some areas shown as floodplains are areas that do not flood
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 – training and assistance 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 Township is not interested in joining CRS as the time of this plan update
How many flood insurance policies are in force in your jurisdiction?*	458
• What is the insurance in force?	\$80,472,000
• What is the premium in force?	\$798,863
How many total loss claims have been filed in your jurisdiction?*	428
• How many claims are still open or were closed without payment?	84 CWOP
• What were the total payments for losses?	\$2,783,511.81
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 – at the time of this plan update, residents have not shown interest in mitigating their properties

*According to FEMA statistics as of July 31, 2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

- **Sustainable Jersey** – 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 is empowering communities to build a better world. Municipalities can receive Sustainable Jersey certification. There are two levels of certification – bronze and silver. The Township is a Sustainable Jersey certified community. The Township received bronze certification on October 4, 2017 with 175 points.
- **Greener Bloomfield** - Greener Bloomfield has broad community representation and a record of achievement in green activity in town since the group began in October 2008, including development of green building guidelines and sustainability language for the Bloomfield





Center Redevelopment Plan. The group meets monthly to coordinate activities and conduct public education and outreach. Greener Bloomfield has a website (<http://greenerbloomfield.org/>) and Facebook page (<https://www.facebook.com/GreenerBloomfield/>) to provide residents information on upcoming events and activities.

- **Green Building Policy** - While the Township Council has not yet adopted a town wide Green Building Policy, they have adopted extensive green building guidelines based on USGBC LEED standards for the Bloomfield Center Redevelopment Plan, which comprises a large portion of Bloomfield’s downtown. The intent is to apply similar standards for the entire Township, especially now that the entire Township has been declared an Area In Need of Redevelopment.
- **Sustainable Land Use Pledge** – The Township adopted a resolution to take steps with regard to their municipal land use decisions with the intent of making the Township a sustainable community. The Township’s intent of this resolution is to include the following principles in the master plan update and to update the zoning code accordingly: facilities siting, housing variety, natural resource preservation, transportation choices, mix of uses, green design, regional cooperation, and parking regulations.
- **Rain Barrel Program** - The Rain Barrel Project, launched in April 2014 as part of Greener Bloomfield's Earth Day efforts, educated town residents on the importance of water conservation. Rain barrels reduce runoff and serve the needs of individual homeowners for landscaping. The Rain Barrel Project was held at the 2014 Earth Day celebration at the Bloomfield Civic Center. It featured a demonstration of how to use a Rain Barrel and signed up people to attend the rain barrel making class.
- **Water Conservation Ordinance** - On September 8, 2009, the Bloomfield Township Council adopted the Water Conservation Ordinance, amending Chapter 556 of the township code. The ordinance asks residents and businesses reduce their water use and conserve water used indoors. The ordinance also spells out what’s required during a severe water emergency. After a first warning, violators can be fined from \$25 to \$2,000, and extreme violators can be penalized with up to 90 days of imprisonment or community service.

9.3.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Bloomfield’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.3-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. 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)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm FEMA-DR-4264	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and	While this was a significant event in Essex County, the Township did not identify significant losses or damages associated with this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			<p>blizzard conditions to the urban corridor and some nearby areas.</p> <p>Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. Bridges and tunnels from New York City into New Jersey were shut down by mid-afternoon Saturday.</p> <p>At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.</p>	

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 Township of Bloomfield’s risk assessment results and data used to determine the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$4,637,793	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$24,834,720	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	5,085	NEHRP D&E:	1,035	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$4,910,094	
						2,500-year Loss:	\$80,412,843	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	6,586	Physical impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or utility interruptions.		Low
		Population Below Poverty Level:	3,996					
Flood	100- and 500- Year Mean Return Period Event	100-year	2,312	100-year	490	100-year Loss:	\$65,998,384	High
		500-year	2,534	500-year	545			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run-down.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	Vehicular accidents, Aviation Accidents, Railway Accidents	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Bloomfield.

- Number of repetitive loss (RL) properties: 27*
- Number of severe repetitive loss (SRL) properties: 0*
- Number of RL/SRL properties that have been mitigated: 0*

* FEMA January 7, 2019

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.3-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
New Jersey State Police Troop D - Bloomfield Station*	Police	X	X	The Township does not have jurisdiction to mitigate this property.
Child Development Center	School	X	X	The Township does not have jurisdiction to mitigate this property.
Watsessing Elementary School*	School	X	X	The Township does not own this building and does not have jurisdiction to mitigate.

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction did not identify additional vulnerabilities.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Bloomfield 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 Bloomfield has significant exposure; refer to Figures 9.3-1 and 9.3-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The table below summarizes the hazard





risk/vulnerability rankings of potential natural hazards for the Township of Bloomfield. The Township of Bloomfield has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

The below table represents the calculated hazard ranking for the Township.

Table 9.3-14. Township of Bloomfield Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Low	Low

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Low	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 9.3-15. Status of Previous HMP Mitigation Actions

2015 Action Number and 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 #
Bloomfield-1	Obtain backup power for critical facilities including: generator for a primary shelter located at 84 Broad Street	Township of Bloomfield OEM	Complete	-	-
Bloomfield-2	Obtain backup power for critical facilities: generator for the Bloomfield fire house located at 124 East Passaic Ave	Township of Bloomfield	Complete	-	-
Bloomfield-3	Flood Study of Third River.	Fire Dept	No Progress – remove from mitigation	-	-



2015 Action Number and 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 #
			strategy for the Township as this would be a state project; however, the Township would be involved		
Bloomfield-4	Third River Bank Erosion: Construct a manmade structure to alleviate flooding	Engineering	In progress – gabion walls installed between Baldwin Street and Hoover Avenue to prevent continuous erosion along the private properties that face Broad Street	X	2020-BLOOMFIELD-001
Bloomfield-5	Further stabilize the banks of Toney’s Brook. Banks need to be further stabilized due to the flooding that has occurred in the past. At risk are the business in the Watsessing Park Area, Watsessing Park itself, and the residences in the area.	Engineering	No Progress – remove from mitigation strategy for the Township as this is not a floodprone area in the Township	-	-
Bloomfield-6	Support the acquisition/elevation of flood-prone properties with priority to repetitive loss and severe repetitive loss structures, where applicable. For this plan update the following were identified as buy-outs: West Bank of Third River, Lion Gate Drive.	Engineering, Law, Administrator	Complete – the Township purchased land where a former factory was located (Scientific Glass); the Township received funding from several sources to purchase the land and the land is now being turned into its natural state (floodplain) and will be used as a municipal park	-	-
Bloomfield-7	Construction and relocation of a permanent DPW facility.	Engineering	No Progress due to lack of funding; remove from the Township’s mitigation strategy	-	-
Bloomfield-8	Bank stabilization of the Second and Third Rivers and WigWam Brook	Engineering	In progress – cleanup has occurred along the waterways to help; Second River has concrete walls along it; however, no progress has been made to help with bank stabilization	X	2020-BLOOMFIELD-002
Bloomfield-9	Enlarge storm sewer system in Ampere Parkway east to Newark border.	Engineering	No progress – there is a high water table in this area; many homes have sump pumps that are constantly running; the Township is currently cleaning out the existing sewer on a	X	2020-BLOOMFIELD-003



2015 Action Number and 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 #
			routine basis but no upgrades have been made		
Bloomfield-10	<p>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:</p> <ul style="list-style-type: none"> • 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 Town 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 in the annual newsletter. • Conduct Town Hall meetings with federal and state representatives • Develop an information booth at Township events such as street fairs etc. 	Township of Bloomfield OEM	Ongoing capability – the Township is doing this through their municipal website and social media	-	-
Bloomfield-11	<p>Develop and implement a post-event damage assessment program, including the following elements:</p> <ul style="list-style-type: none"> • Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. 		Ongoing capability – this is part of the Township’s day-to-day responsibilities and during storm events	-	-



2015 Action Number and 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 #
	<ul style="list-style-type: none"> Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Town/Village (e.g. building permit process). 				
Bloomfield-12	Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.		Ongoing capability – if the Township decides to enter CRS they will need to hire a consultant to assist with the process	-	-
Bloomfield-13	Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).		Complete	-	-
Bloomfield-14	Have designated NFIP Floodplain Administrator (FPA), and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).		No Progress	X	2020-BLOOMFIELD-004



PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

A risk assessment workshop was held in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. Those attending were provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 9.3-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Bloomfield 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.3-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.3-18 summarizes the actions by type across hazards of concern.



Table 9.3-16. 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-BLOOMFIELD-001	Third River Bank Erosion: Construct a manmade structure to alleviate flooding	Problem: Gabion walls installed between Baldwin Street and Hoover Avenue to prevent continuous erosion along the private properties that face Broad Street. However, erosion still occurs along other areas of the Third River in Bloomfield.	Both	Flood, Severe Weather	1, 2	<u>Township DPW</u>	Municipal Budget, FEMA HMGP	Decrease erosion, increase flood protection	\$125,000	Within 5 years	Medium	SIP	PP
		Solution: Install gabion walls in other areas in Bloomfield along Third River.											
2020-BLOOMFIELD-002	Bank stabilization of the Second and Third Rivers and WigWam Brook	Problem: Cleanup has occurred along the waterways to help; Second River has concrete walls along it; however, no progress has been made to help with bank stabilization.	Existing	Flood, Severe Weather, Severe Winter Weather, Geological	1, 2	<u>Township DPW</u>	NJDEP Water Quality Grant, USEPA Urban Waters Small Grants	Stabilize stream bank, increase water quality	\$100,000	Within 3 years	Medium	SIP, NSP	PP, NR
		Solution: Stabilize the stream bank long the Second and Third Rivers and WigWam Brook.											
2020-BLOOMFIELD-003	Feasibility Study on storm sewer system in Ampere Parkway east to Newark border	Problem: There is a high-water table in this area; many homes have sump pumps that are constantly running; the Township is currently cleaning out the existing sewer on a routine basis but no upgrades have been made.	Existing	Flood, Severe Weather	1, 2	<u>Township DPW</u>	FEMA PDM, Municipal Budget	Gain understanding of the flooding issue and identify solutions	\$75,000	Within 5 years	Medium	LPR	PR
		Solution: Perform a feasibility study on storm sewer system to determine the best solution to reduce or alleviate flooding in this area of the Township.											
2020-BLOOMFIELD-004	NFIP FPA Education and Certification	Problem: The current FPA is not a CFM.	Existing	Flood	All	<u>Township Administration</u>	Municipal Budget	Increase education and awareness of FPA	>\$5,000	Within 3 years	Medium	LPR	PR
		Solution: The current FPA will become a CFM and pursue relevant continuing education training.											



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-BLOOMFIELD-005	Mitigate flood-prone properties, including RL/SRL properties	<p>Problem: There are 27 repetitive loss properties located in the Township. These properties have been repeatedly damaged by flooding.</p> <p>Solution: Conduct outreach to 27 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 mitigation residential homes that experience frequent flooding (high risk areas).</p>	Existing	Flood	1, 2, 5	Township FPA, Township Administration	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.	\$4 million	Within 3 years	Medium	SIP, EAP	PI, PP
2020-BLOOMFIELD-006	Critical Facilities in the Floodplain	<p>Problem: There are four critical facilities in the Township that are located in the 1% annual chance flood area. The Township does not have jurisdiction to mitigate these properties.</p> <p>Solution: The Township will work with the facility owners/operators to inform them their facilities are located in the floodplain and provide different mitigation options to protect the facilities from flood damages.</p>	Existing	Flood	1, 2	Township FPA, Township Administration	Municipal Budget	Increase knowledge about facilities in floodplain, educate	<\$10,000	Within 1 year	High	LPR	PR
2020-BLOOMFIELD-007	Debris Management Plan	<p>Problem: The Township does not have a formal debris management plan in place. While the Township performs debris cleanup after an event, having a pre-incident planning process in place will help prepare the Township for effective debris management.</p>	New and Existing	All	All	Township OEM, Township DPW	Municipal Budget	Better prepared to restore services, ensures public health and safety after a disaster, plan in place	\$20,000	Within 3 years	Medium	LPR	PR, 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
		Solution: The Township will develop a debris management plan. The plan will include, but not limited to, staff roles and responsibilities, different situations, information on debris clearing and collection, where material will be stored, and a health and safety plan.						before an event occurs					

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 9.3-17. 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-BLOOMFIELD-001	Third River Bank Erosion: Construct a manmade structure to alleviate flooding	1	1	1	1	0	0	0	1	0	0	1	1	0	0	7	Medium
2020-BLOOMFIELD-002	Bank stabilization of the Second and Third Rivers and WigWam Brook	1	1	1	1	0	0	0	1	0	0	1	1	0	0	7	Medium
2020-BLOOMFIELD-003	Feasibility Study on storm sewer system in Ampere Parkway east to Newark border	1	1	1	1	0	0	0	1	0	0	1	1	0	0	7	Medium
2020-BLOOMFIELD-004	NFIP FPA Education and Certification	1	1	1	1	0	1	1	0	0	1	0	1	0	0	8	Medium
2020-BLOOMFIELD-005	Mitigate flood-prone properties, including RL/SRL properties	1	1	1	1	0	0	1	0	0	1	0	1	0	0	7	Medium
2020-BLOOMFIELD-006	Critical Facilities in the Floodplain	1	1	1	1	1	0	1	0	0	1	1	1	0	0	9	High
2020-BLOOMFIELD-007	Debris Management Plan	1	1	1	1	0	0	1	1	0	0	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 9.3-18. 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 Erosion and Sea Level Rise	-007				-007			
Coastal Storm	-007				-007			
Drought	-007				-007			
Earthquake	-007				-007			
Extreme Temperature	-007				-007			
Flood	-003, -004, -006, -007	-001, -002, 005	-005	-002	-007	-001, -002, 005		
Geological	-007	-002		-002	-007			
Severe Weather	-003, -004, -007	-001, -002		-002	-007	-001, -002, 005		
Severe Winter Weather	-007	-002		-002	-007			
Wildfire	-007				-007			
Civil Disorder	-007				-007			
Cyber Attack	-007				-007			
Disease Outbreak	-007				-007			
Economic Collapse	-007				-007			
Hazardous Substances	-007				-007			
Utility Interruption	-007				-007			
Terrorism	-007				-007			
Transportation Failure	-007				-007			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.3.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Bloomfield 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.3-19. Contributors to the Annex

Entity	Title	Method of Participation
Fred Menzel	OEM Coordinator	Attended meetings, provided input, updated status of previous mitigation actions
Thomas Pelsia	Deputy OEM Coordinator	Attended meetings, provided input, updated status of previous mitigation actions
Paul Lasek	Township Engineer	Attended meetings, provided input, updated status of previous mitigation actions, included information on the Township’s floodplain administration program



Figure 9.3-1. Township of Bloomfield Hazard Area Extent and Location Map

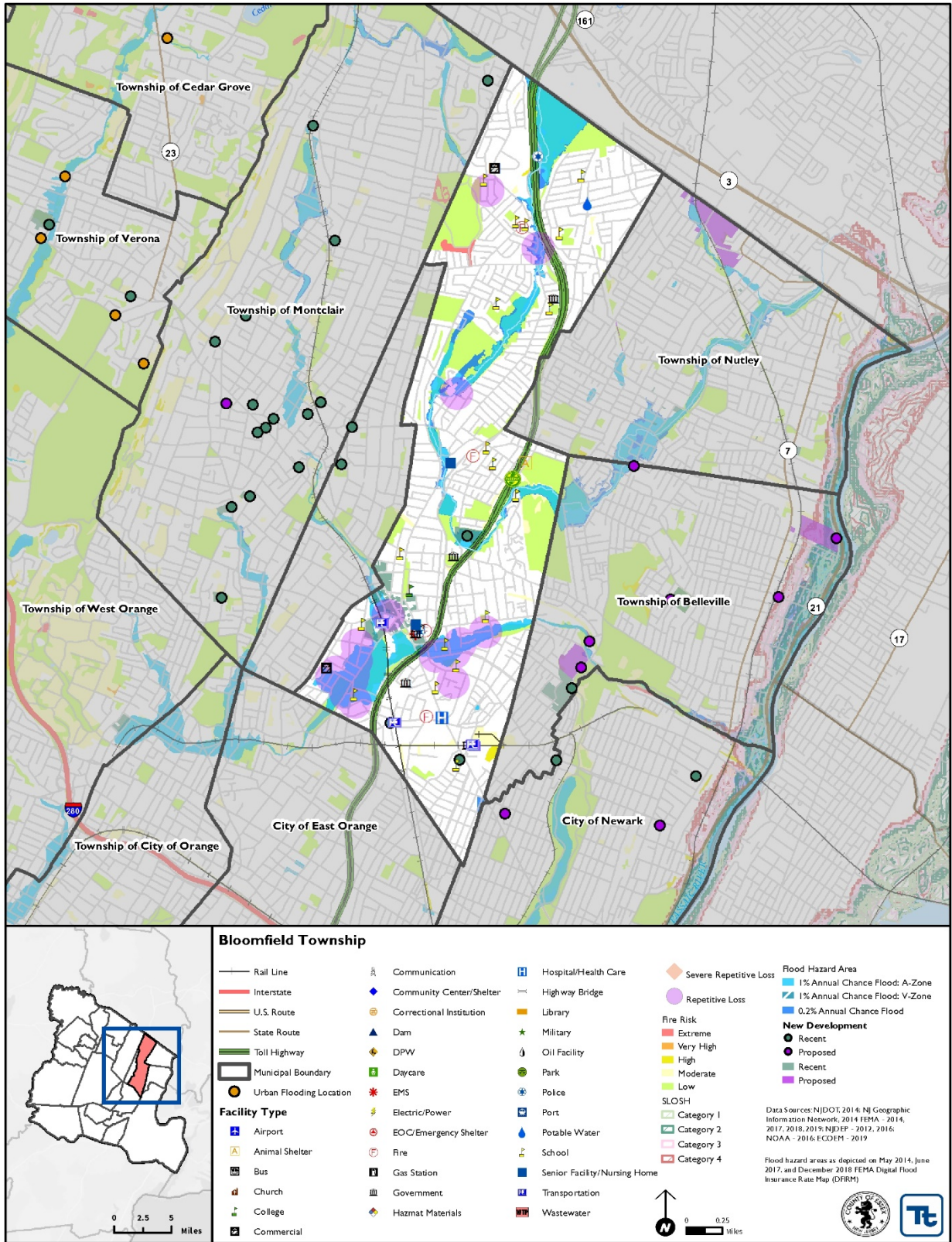
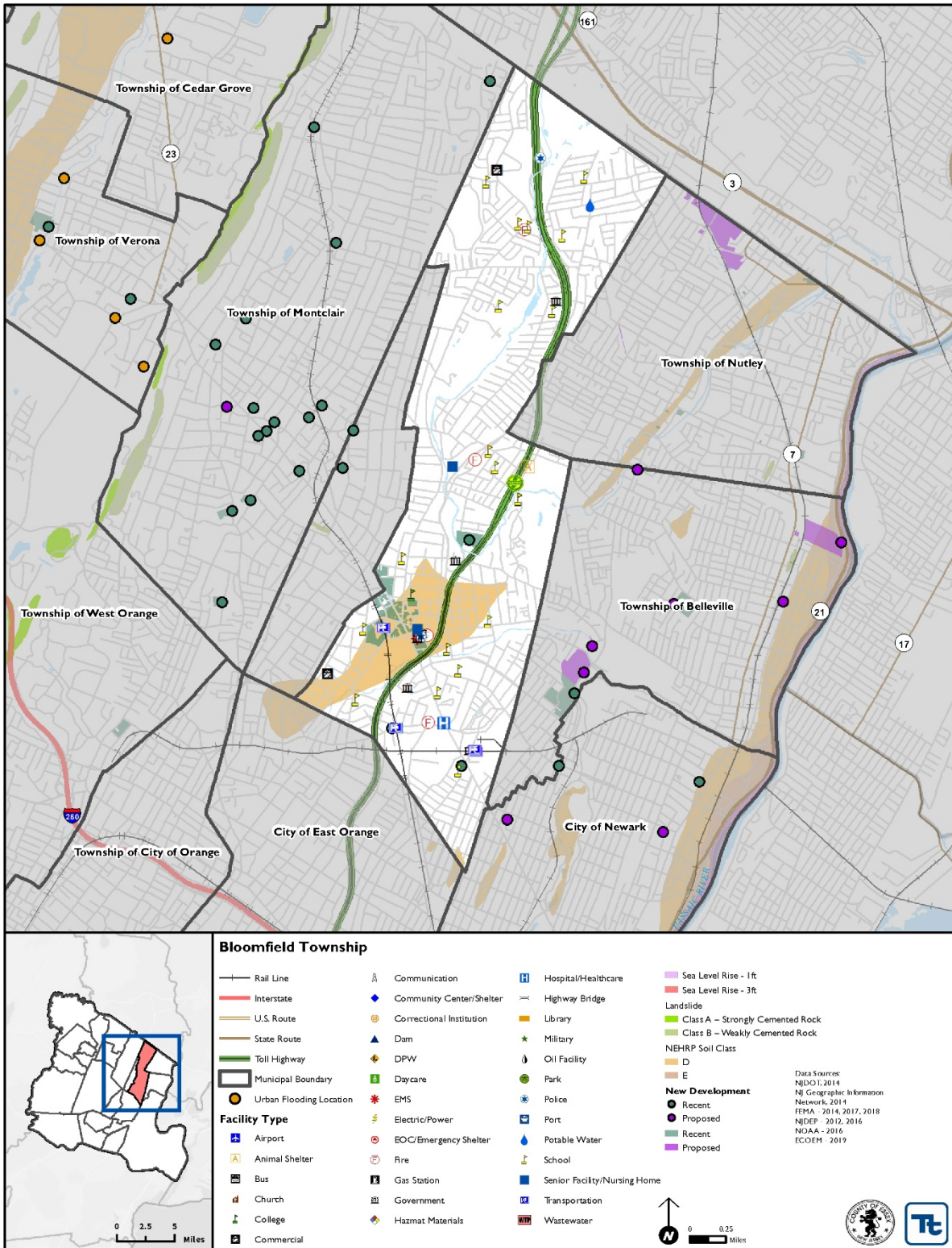




Figure 9.3-2. Township of Bloomfield Hazard Area Extent and Location Map 2





BOROUGH OF CALDWELL

MUNICIPALITY AT A GLANCE

Total Population: **8,032**
 Total Land Area: **1.2 sq mi**
 Total # Buildings: **1,738**



1% Annual Chance Flood



5

Population Residing in Floodplain



0

Persons That May Seek Shelter



\$0

Potential Building Damages



0

Critical Facilities in Floodplain

100-Year MRP Event Wind Loss



\$586 Thousand

Potential Building Damages

NFIP Statistics



3 # NFIP Policies

0 # SRL NFIP Properties

0 # RL NFIP Properties



Mitigation Action Plan (2020-2025)

Hazard

Earthquake, Flood (Urban/Flash), Severe Weather, Severe Winter Weather, Utility Interruption

Project Types

Prevention, Property Protection, Public Education/Awareness, Natural Resource Protection, Emergency Services, Structural Projects

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9.4 BOROUGH OF CALDWELL

This section presents the jurisdictional annex for the Borough of Caldwell. The annex includes a general overview of the Borough; an assessment of the Borough’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 hazards.

9.4.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Caldwell’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
Name / Title: Mark Guiliano, Emergency Management Coordinator Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4629 Email: fireofficial@caldwell-nj.com	Name / Title: Brian Maclay, Deputy Emergency Management Coordinator Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4629 Email: fireinspector@caldwell-nj.com
NFIP Floodplain Administrator	
Name / Title: Paul Milani, Construction Official/Zoning Officer Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4626 Email: mbifalco@caldwell-nj.com	

9.4.2 Jurisdiction Profile

The Caldwell’s were settled in the early 18th Century. The 22nd and 24th President of the United States, Grover Cleveland, was born in Caldwell. In 2010, New Jersey Monthly magazine ranked Caldwell the third best place to live in New Jersey (The Official Website of Caldwell, NJ, 2014).

The Borough of Caldwell operates under the borough form of government which consists of a Mayor and six-member Council. The Council is elected at-large every three years on a staggering basis with two seats coming up for election every year. The Mayor is elected every four years (The Official Website of Caldwell, NJ, 2014).

According to the U.S. Census Bureau, the Borough has a total land area of 1.167 square miles, of which 1.166 square miles is land and 0.001 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Caldwell was 7,822. The estimated 2017 population was 8,032, a 2.7 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.9 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.

9.4.3 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. Figures 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, where available.

Table 9.4-2. Recent and Expected Future Development

Type of Development	2015	2016	2017	2018	2019 YTD
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	1	1	2	7	6
Multi-Family	1	0	11	5	0
Other (commercial, mixed-use, etc.)	1	0	0	10	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					
Water Main Upgrades	Infrastructure Upgrades	-	Throughout the Borough	-	Ongoing Infrastructure Upgrades
The Wilson	Mixed-Use	1	307 Bloomfield Avenue	-	To be completed in 2020.
Grover House	Mixed-Use	1	333 Bloomfield Avenue	-	Completed and occupied by tenants.
Caldwell OEM Emergency Operations Center	Infrastructure	1	-	-	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Multi-Level Parking Garage	Infrastructure	3 or 4 Story Parking Structure	Location Pending	-	Development in planning stages

* Only location-specific hazard zones or vulnerabilities identified.

9.4.4 Capability Assessment

The Borough of Caldwell 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 Caldwell.



Table 9.4-3. 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 and State	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. Administered by the Caldwell Building Department. Chapter 81 Construction Codes, Uniform of the municipal code. Original adoption 1977 with various amendments.					
Zoning Code	Yes	Local and State	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 250 Zoning of the municipal code. Adopted in 1979.					
Subdivisions	Yes	Local and State	Yes	-	-
Comment: 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 210 Subdivision and Site Plan Review of the municipal code. First adopted in 1980 with amendments. Administered by the Borough of Caldwell Planning Board or Board of Adjustment.					
Stormwater Management	Yes	Local	Yes	No	-
Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 206 Stormwater Control of the municipal code. Adopted in March 2006. It is the purpose of this chapter to establish 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.					
Growth Management	No	-	Yes	-	-
Comment: State mandated at local level					
Shoreline Development	No	-	Yes – if coastal community	-	-
Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.					
Site Plan Review	Yes	Local	Yes	Yes/No	Yes/No
Comment: Chapter 210 Subdivision and Site Plan Review of the municipal code. First adopted in 1980 with amendments. Administered by the Borough of Caldwell Planning Board or Board of Adjustment.					
Environmental Protection	No	-	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.					
Flood Damage Prevention	Yes	Local	No	No	-
Comment: Chapter 110 Flood Damage Prevention (adopted June 2007, establishes the Caldwell Construction Official as the floodplain administrator) and Chapter 111 Floodplain Management (adopted in February 2000, Borough Clerk responsible for administering) in the municipal code.					
Wellhead Protection	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:					
Emergency Management	Yes	Local	No	-	-
Comment: Yes, Ordinances establishing OEM/Deputy Coordinator (Annual Ordinance) 3 Year Term. Chapter 23 Fire Department and Chapter 41 Police Department of the municipal code.					
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	Yes/No	Yes/No
Comment: Borough of Caldwell Master Plan Re-Examination Report 2017. Previous reports: Re-examination Report in 2005 and original Master Plan in 1998. The 2017 Reexamination report includes mapping of Greenways, land use natural features.					
Capital Improvement Plan	No	-	Allowed	-	-
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.					
Disaster Debris Management Plan	No	-	No	-	-
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local and State	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).					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	-	-
Comment:					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:-					
Shoreline Management Plan	No	-	No	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:					
Community Wildfire Protection Plan	No	-	No	No	-
Comment:					
Community Forest Management Plan	No	-	No	No	-
Comment:					
Transportation Plan	No	-	No	No	-
Comment:					
Agriculture Plan	No	-	No	No	-
Comment:					
Climate Action Plan	No	-	No	No	-
Comment:					
Tourism Plan	No		No	No	-
Comment:					
Business Development Plan	No		No	No	-
Comment:					
Other	-	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	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.					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	No	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	No	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes		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, jurisdiction is fully built out

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Caldwell.

Table 9.4-5. 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	Yes	Open Space Trust Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Code Red / Nixle
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Surrounding Communities, County, State (for continuity of operations, HazMat (Nutley))
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning / Zoning Boards
Engineers or professionals trained in building or infrastructure construction practices	Yes	Planning / Zoning Boards; Construction Official
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	Yes	Finance; Chief Financial Officer and Borough Administrator analyze costs
Surveyors	No	-
Personnel skilled or trained in GIS applications	Yes	Licensed water operator; Borough engineer; Borough has purchased GIS software
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Grant writers	No	Grant applications are currently written by staff
Resilience Officer	No	-
Other	Yes	Contractors to assist with Debris Management; Paul Milani Building Inspector/Code Enforcement; IT



Staff/Personnel Resource	Available?	Department/Agency/Position
		Director (Consultant); Communication Officer

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Caldwell.

Table 9.4-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Borough Administrator
Capital Improvements Project Funding	Yes – Administration/Finance
Authority to Levy Taxes for Specific Purposes	Yes – Mayor and Council
User Fees for Water, Sewer, Gas or Electric Service	Yes - Sewer (Mayor and Council)
Incur Debt through General Obligation Bonds	Yes - Mayor and Council
Incur Debt through Special Tax Bonds	Yes – Mayor and Council
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 Caldwell.

Table 9.4-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes; Council
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes; Links to FEMA/NJOEM/NFPA
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Facebook, Twitter, Website
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes; Environmental Commission
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes; Nixle / Code Red / Reverse911 / Social Media
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; Air Raid Sirens, PA System (Police)

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Caldwell.



Table 9.4-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	NP	_____	Date
Building Code Effectiveness Grading Schedule (BCEGS)	NP	_____	Date
Public Protection (Fire ISO Protection Class)	Yes	5	2016
Storm Ready Certification	NP	_____	Date
Firewise Community Classification	NP	_____	Date
Sustainable Jersey	Yes	Bronze	10/4/2017

NP = Not participating

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.

Table 9.4-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood (riverine / flash flood, SLR)	Medium
Geological Hazards (landslides and subsidence/sinkholes)	Medium
Severe Weather (high wind, tornado, TSTM, and hail)	Medium
Severe Winter Weather (heavy snow, blizzards, and ice storms)	Medium
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure	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 9.4-10. 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)	Paul Milani, Building/ Zoning Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes/No
What is the date that your flood damage prevention ordinance was last amended?	12/06/2007
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 02/21/2002
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	No High intensity storms are causing increased flooding throughout the Borough in areas which previously did not flood. This is not represented
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes Any additional technical assistance or training would be utilized by the Borough
<input type="checkbox"/> If so, what type of assistance/training is needed?	Floodplain Management, National Flood Insurance Program Training, Technical Assistance on Mitigation
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> 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?* <ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Flood insurance policies: 3 Insurance in force: \$555,000 Premium in force: \$2,416
How many total loss claims have been filed in your jurisdiction?* <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Total loss claims: 1 Claims still open or were closed without payment: 1 Total payments for losses: \$4617.45
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

9.4.5 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 in this subsection and the mitigation strategy, where appropriate.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough of Caldwell made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:



- **Caldwell municipal webpage:** The Caldwell municipal website (<http://www.caldwell-nj.com/content/79/default.aspx>) includes information for various departments, codes, and more. The website includes links to social media and provides links and instructions to sign up for emergency alerts and the special needs registry. The municipal website can be used to communicate hazard related information.
- **Office of Emergency Management:** The Borough of Caldwell Office of Emergency Management coordinates the plans and operations of the various components of the emergency management system - police and fire, emergency medical service, public works, volunteers and other groups contributing to the management of emergencies. The Emergency Management Coordinators are the point people responsible for implementing the Emergency Management Plan and directing the emergency response. The Office of Emergency Management works in conjunction with other municipal entities to implement Hazard Mitigation Initiatives.
- **Board of Health:** The Caldwell Board of Health is responsible for the day to day function of the Health Department which includes the administering of retail food and pet licenses, handling complaints, and Vital Statistics, which includes the recording of all births, deaths, marriages, and civil unions that occur within a municipality. The Board of Health also works on health preparedness planning.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.
- **Sustainable Jersey:** Caldwell is a Sustainable Jersey certified community--one of only 198 in the state. Caldwell achieved Sustainable Jersey certification at the bronze level. Certified towns are an outstanding group of municipalities that are making important contributions toward the long-term goal of a sustainable New Jersey and world. Actions related to hazard mitigation that resulted in points for certification included:
 - *Municipal On-Site Solar System:* The Caldwell Sewage Treatment plant has a solar installation under the present PSEG Solar4All Program extension. The plan includes a photovoltaic array with about 200kW of peak output and battery backup to allow for continued operation during grid outages.
 - *Tree Protection Ordinance:* The Tree Protection Ordinance has been in effect for many years. Throughout the years, the Borough advertised regulations by news articles, letters to the editor and comments in the site plan reviews.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the Borough of Caldwell 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 Essex 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 Flood Damage Prevention Ordinance (Chapter 110 of the municipal code) lacks the state mandated 1-foot freeboard requirement. The borough can update the ordinance to include this requirement.
- The Master Plan could be updated to reference the hazard mitigation plan and cover hazard related topics.



9.4.6 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Borough of Caldwell’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.4-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.4-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
March 14, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	Plowing/Clearing of Snow, Snow Removal, Salting/Sanding, Towing, Emergency Evacuation, Sheltering, Emergency Repairs, Sandbagging. \$19,680k of labor costs for downtown snow removal, Total cost is approximately \$40k, Reimbursed \$13k
May 1, 2018	Severe Storm	N/A	A severe storm brought strong winds.	Downed trees, downed wires, school was closed. Substantial labor costs, debris storage, \$35,000 for tub grinder.
March 7, 2018	Winter Storm Quinn	N/A	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. Trained spotters and the public reported 1 to 2 feet of snow. 23.0 inches was reported in North Caldwell and 19.7 inches in Roseland. The heavy wet snow and strong winds also brought down trees and some power lines.	Downed trees, damage street signs, downed wires. Approx. \$80k of reimbursements for DPW, Fire, Police, Health
March 21, 2018	Winter Storm Toby	N/A	Winter storm brought wind and snow.	Power outages (opened up warming center). Declared State of Emergency for Winter Storm.
November 8, 2018	Flood	N/A	Heavy rainfall.	Damaged Culverts, Parking Deck (Municipal), Retaining Walls, Retaining Walls, Sidewalks, Steep Slopes, Landscaping, Library (1st Flood Inundated). Approximately > \$400k, Still assessing damages.



9.4.7 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 Caldwell.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Caldwell.

- 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

*Note: The number of SRL properties excludes RL properties.
 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).*

CRITICAL FACILITIES

No identified critical facilities or lifelines in the community are located in the 1-percent and 0.2-percent floodplain.

Table 9.4-12. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Potential Loss from 1% Flood Event	
		1% Event	0.2% Event	Percent Structure Damage	Percent Content Damage
None					



Table 9.4-13. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$585,788	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$4,486,911	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	4,808	NEHRP D&E:	1,002	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$1,229,842	
						2,500-year Loss:	\$18,524,023	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,338	Physical 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.		Low
		Population Below Poverty Level:	583					
Flood	100- and 500-Year Mean Return Period Event	100-year	5	100-year	1	100-year Loss:	\$0	High
		500-year	5	500-year	1			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	43	Class B:	8	Class B:	\$4,937,770	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power or water supply caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Lack of training in response to earthquake.
- Large trees and old infrastructure results in utility failures.
- Runoff from White Rock/Ferndale causes increased flow and flooding.
- The Pine Brook along Bloomfield Avenue is obstructed by vegetation and debris and leads to flooding along Bloomfield Ave Corridor.
- More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield Avenue Corridor and due to lack of stormwater drainage.
- Recent flooding events in conjunction with increased stormwater runoff has left the Borough of Caldwell susceptible to stormwater flooding.
- A significant portion of the Borough of Caldwell does not fall within a FEMA Delineated Special Flood Hazard Area (SFHA), but high intensity, short duration rainfall events cause significant flooding in conjunction with stormwater runoff due to Borough being built out has led to flood damages sustained to commercial and residential structures.
- The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately \$700,000 worth of damage
- The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.
- Caldwell Public Library lacks backup power.
- Lincoln Elementary School lacks backup power.
- Urban Flooding in Downtown/Municipal Complex along Bloomfield Ave, Personette Street, Hatfield, Brookside, Westville.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Caldwell 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 Caldwell has significant exposure; Figures 9.4-1 and 9.4-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Borough of Caldwell. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any



other changes needed. The Borough of Caldwell has reviewed the Essex 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 flood from low to high due to recent flash flooding events which have caused significant impact in the Borough.
- The Borough changed the hazard ranking for wildfire from low to medium because of the high amount of vegetation throughout the Borough.
- The Borough changed the hazard ranking for cyber-attack from low to medium.
- The Borough changed the hazard ranking for terrorism from low to medium due to their proximity to major urban areas.

Table 9.4-14. Borough of Caldwell Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	High	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Medium	Low

9.4.8 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 9.4-15. 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 #
Caldwell-1: Caldwell CVFD and Caldwell Community Center generator.	Borough Administrator	Completed	-	-
Caldwell-2: Caldwell Pine Brook flood control/bank stabilization project.	Borough Engineering	In Progress - Issues with Private Land Ownership	X	2020-Caldwell-001
Caldwell-3: Conduct a Water, Sewer, and Stormwater Study and includes video inspection of Stormwater and Sewer lines	Borough Engineering	In Progress	X	2020-Caldwell-007
Caldwell-4: Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding	Borough Engineering	In Progress - Issues with Jurisdiction	X	2020-Caldwell-008
Caldwell-5: 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.	Borough Administrator	Discontinue - Ongoing Capability	-	-
Caldwell-6: Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Borough Administrator	Discontinue - Ongoing Capability	-	-
Caldwell-7: The HMP will be used as a guide when the Borough reviews/updates their ordinances.	Borough Administrator	Discontinue - Ongoing Capability	-	-

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Caldwell participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Caldwell participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 9.4-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Caldwell 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.4-17 provides a summary of the





prioritization of all proposed mitigation initiatives for this HMP update and Table 9.4-18 summarizes the actions by type across hazards of concern.



Table 9.4-16. 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-Caldwell-001	Caldwell Pine Brook flood control/bank stabilization project	The Pine Brook along Bloomfield Avenue is obstructed by vegetation and debris and leads to flooding along the Bloomfield Avenue Corridor	Caldwell DPW will work in conjunction with Essex County Public Works and Private Property owners to clear debris and vegetation out of stream to promote better flow within the Pine Brook and reduce occurrences of flooding.	N/A	Flood	2	<u>Borough DPW</u> , Borough Administration, Borough Engineer FPA	Federal, State Grants, Municipal Budget	Medium	\$20,000 Annually	Within 18 months	High	NSP, SIP	N, R, SP
2020-Caldwell-002	Stormwater Infrastructure Upgrades	More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield	Caldwell Engineering/OEM will work with Essex County Engineering/Public Works to determine if additional stormwater	Existing	Flood, Severe Storm	2	<u>Borough Engineering</u> , Borough OEM, Essex County Public Works	Federal and State Grants, County Budget, Municipal Capital Funding	High	High	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
		Avenue Corridor and due to lack of stormwater drainage.	infrastructure can be installed along Bloomfield Avenue. If upgrades can be made, Caldwell Engineering will work with Essex County to improve the existing stormwater infrastructure.											
2020-Caldwell-003	Green Stormwater Infrastructure Public Outreach	Recent flooding events in conjunction with increased stormwater runoff has left the Borough of Caldwell susceptible to stormwater flooding.	Rutgers Cooperative Extension has started a green stormwater infrastructure study along the Bloomfield Avenue Corridor. Caldwell OEM and Municipal Officials will support Rutgers	N/A	Flood, Severe Storm	2, 3	<u>Borough OEM,</u> Borough Administration, Rutgers Cooperative Extension	Federal and State Grants, Municipal Budget	High	\$10,000	Within 1 year of study completion	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
			Cooperative Extension by assisting with public education and outreach for the citizens of Caldwell related to implementation of potential green stormwater infrastructure projects identified as a result of the study.											
2020-Caldwell-004	NFIP Insurance Public Outreach	A significant portion of the Borough of Caldwell does not fall within a FEMA Delineated Special Flood Hazard Area (SFHA), but high	Caldwell OEM will provide additional information regarding National Flood Insurance Program policies to affected residential and commercial	N/A	Flood, Severe Storm	3	<u>Borough OEM,</u> Borough Administration	Federal and State Grants, Municipal Budget	High	Low	Within 1 year	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
		intensity, short duration rainfall events cause significant flooding in conjunction with stormwater runoff due to Borough being built out has led to flood damages sustained to commercial and residential structures.	property owners.											
2020-Caldwell-005	Floodproofing Caldwell Municipal Library	The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately	Caldwell DPW will work to install floodproofing measures to mitigate damage sustained from flooding events on Bloomfield Ave.	Existing	Flood, Severe Storm	2	<u>Borough DPW</u> , Borough OEM, Borough Administration	Federal and State Grants, Municipal Budget	High	Medium	Within 18 months	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
		\$700,000 worth of damage.												
2020-Caldwell -006	FEMA HMA Phased Project for Bloomfield Ave Corridor Flooding	The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.	Caldwell will gather data and submit an HMA Grant to request funding to fund a flood study along the corridor and based on the results of the study will implement the best alternative.	N/A	Flood, Severe Storm	2, 6	<u>Borough OEM</u> , Borough Engineer/FPA, Borough Administration	Federal and State Grants, Municipal Capital Improvements, Municipal Budget	High	High	Within 3 years	Medium	SIP	PP
2020-Caldwell -007	Water, Sewer, and Stormwater Study	Caldwell's Aging Infrastructure has led to breakages or inadequate capacity for stormwater drainage leading to	Conduct a Water, Sewer, and Stormwater Study and includes video inspection of Stormwater and Sewer lines	Existing	Flood, Severe Storm	2	<u>Borough Engineer/FPA</u> , Borough Administration	Federal and State Grants	High	Medium	Within 3 years (DOF)	High	SIP	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
		flooding during heavy rainfall events.												
2020-Caldwell -008	Flood Studies of the Calamus and Grover Brook	Various streams run through Caldwell and flood during high intensity rain events leading to property damage.	Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding and implement the best identified alternative.	N/A	Flood	2	Borough Engineering, FPA	Federal and State Grants	High	High	Within 3 years	Medium	LPR, SIP	SP, PR
2020-Caldwell -009	Power Line Mitigation	There are power lines in Caldwell which are above ground and vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.	Conduct study to determine if specific areas have more occurrences of downed power lines than others, and work to bury power lines or focus tree trimming program on these areas.	Existing	Severe Storm, Severe Winter Storm, Utility Interruption	2	Engineering	Municipal budget, HMGP, CHIPS	Reduction in power outages and property damages	\$3 million per mile of buried line, \$5 for tree trimming	Within 1 year	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-Caldwell-010	Earthquake Education and Outreach	Caldwell has a high earthquake risk based on the HMP Risk Assessment Results.	Borough Officials will work to develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses	Both	Earthquake	1, 2, 3	Borough Administration, Borough OEM	Municipal budget	Reduction in property damages related to earthquake events and increased awareness	Low	Within 18 Months	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 9.4-17. 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-Caldwell-001	Caldwell Pine Brook flood control/bank stabilization project	1	1	1	1	0	0	1	1	1	1	0	1	0	0	9	High
2020-Caldwell-002	Stormwater Infrastructure Upgrades	1	1	1	1	0	0	1	1	1	1	0	1	0	0	9	High
2020-Caldwell-003	Green Stormwater Infrastructure Public Outreach	1	1	1	1	1	1	1	1	1	1	1	1	0	0	12	High
2020-Caldwell-004	NFIP Insurance Public Outreach	1	1	1	1	1	1	1	1	1	1	0	1	1	0	12	High
2020-Caldwell-005	Floodproofing Caldwell Municipal Library	1	1	1	1	1	1	1	0	0	1	0	1	0	0	11	High
2020-Caldwell-006	FEMA HMA Phased Project for Bloomfield Ave Corridor Flooding	1	1	1	1	0	1	0	1	0	0	0	1	0	0	8	Medium
2020-Caldwell-007	Water, Sewer, and Stormwater Study	1	1	1	1	1	1	1	0	0	1	0	1	0	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-Caldwell-008	Flood Studies of the Calamus and Grover Brook	1	1	1	1	0	1	0	1	0	0	0	1	0	0	8	Medium
2020-Caldwell-009	Power Line Mitigation	0	1	1	1	1	1	0	0	1	1	0	0	1	1	9	High
2020-Caldwell-010	Earthquake Education and Outreach																

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.4-18. 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 Erosion and Sea Level Rise								
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)								
Drought								
Earthquake			2020-Caldwell-010					
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-Caldwell-008		2020-Caldwell-003, 2020-Caldwell-004, 2020-Caldwell-005	2020-Caldwell-001		2020-Caldwell-007		
Geological Hazards (landslides and subsidence/sinkholes)								
Severe Weather (high wind, tornado, TSTM, and hail)	2020-Caldwell-008	2020-Caldwell-009	2020-Caldwell-003, 2020-Caldwell-004			2020-Caldwell-005, 2020-Caldwell-006, 2020-Caldwell-007		
Severe Winter Weather (heavy snow, blizzards, and ice storms)		2020-Caldwell-009						
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-Caldwell-009						
Terrorism								
Transportation Failure								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.4.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Caldwell 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.4-19. Contributors to the Annex

Entity	Title	Method of Participation
Mark Guiliano	Emergency Management Coordinator	Primary POC; attended meetings; provided information requested to update the annex
Brian Maclay	Deputy Emergency Management Coordinator	Alternate POC; provided information requested to update the annex
Mario BiFalco	DPW Director	Attended Annex Meeting; provided information requested to update the annex



Figure 9.4-1. Borough of Caldwell Hazard Area Extent and Location Map

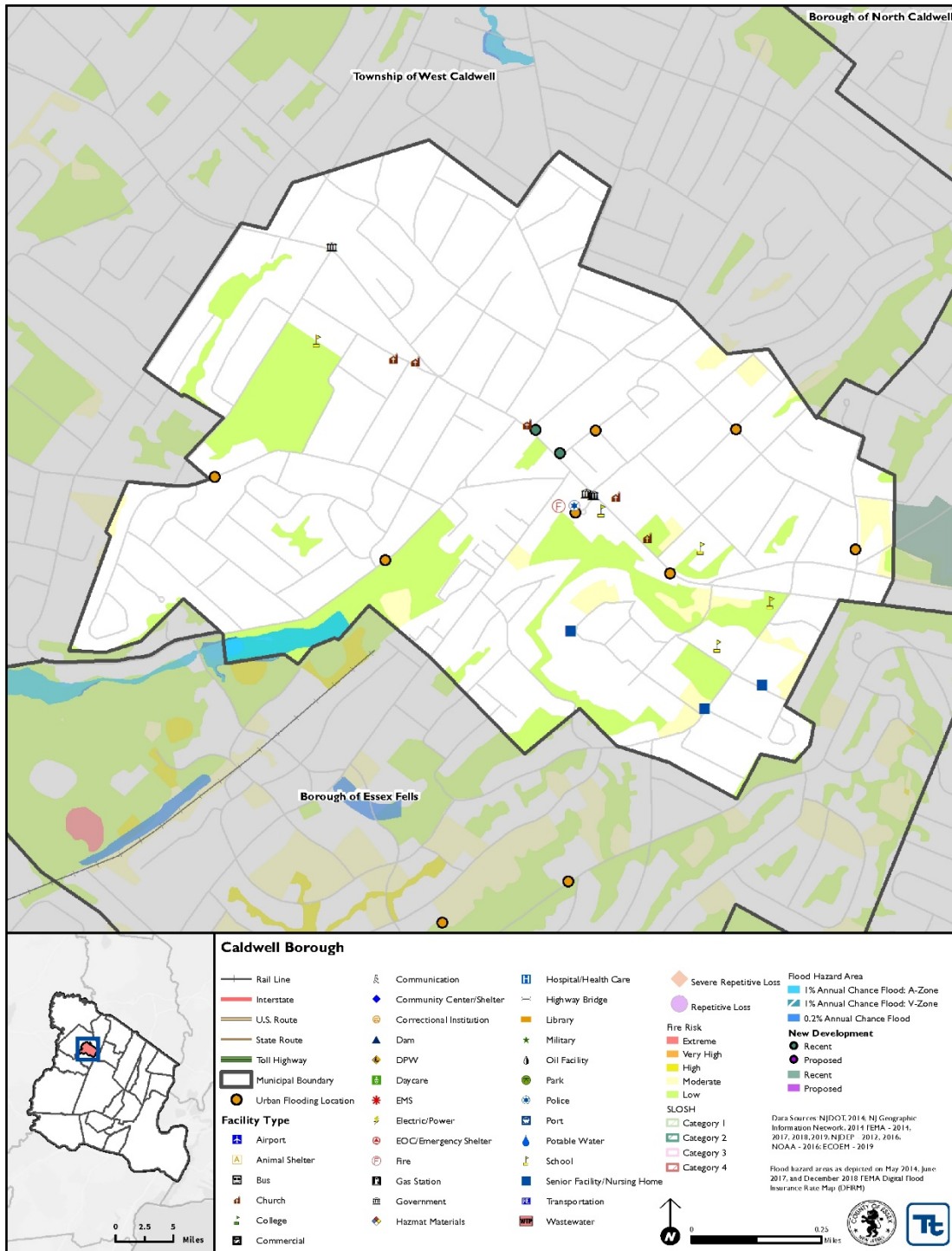
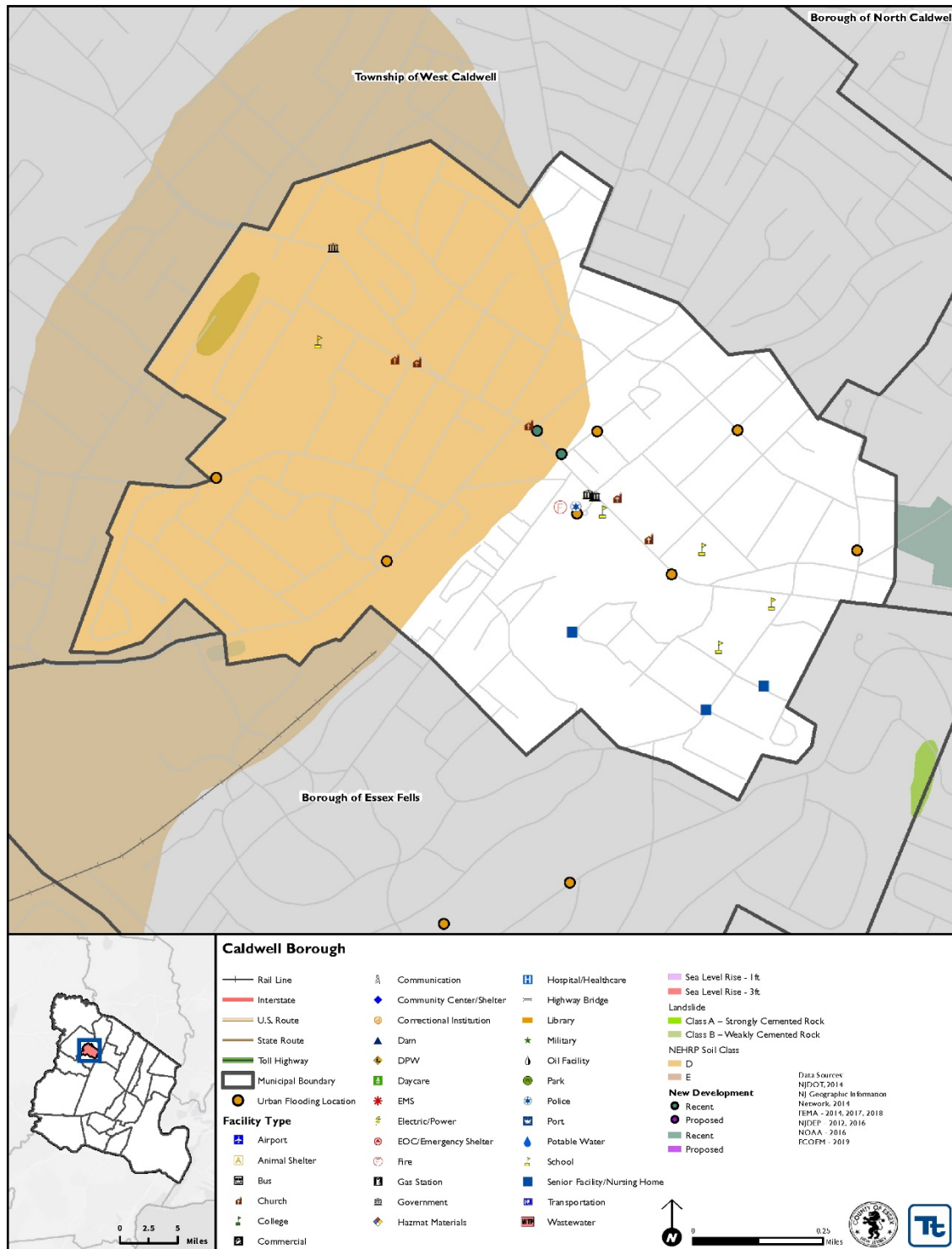




Figure 9.4-2. Borough of Caldwell Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield Avenue Corridor and due to lack of stormwater drainage.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell Engineering/OEM will work with Essex County Engineering/Public Works to determine if additional stormwater infrastructure can be installed along Bloomfield Avenue. If upgrades can be made, Caldwell Engineering will work with Essex County to improve the existing stormwater infrastructure.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by flood study	Goals Met:	2
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	Costly and may not solve problem
	Replace all structural stormwater infrastructure with green stormwater infrastructure	\$2,000,000+	May not solve problem
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 study for Park Ridge	
Project Number:	2020-Caldwell-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	0	Borough would need to work with Essex County to implement project.
Fiscal	1	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet



Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately \$700,000 worth of damage.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell DPW will work to install floodproofing measures to mitigate damage sustained from flooding events on Bloomfield Ave.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	500-Year	Estimated Benefits (losses avoided):	Reduction in flood risk to Municipal Library
Useful Life:	25	Goals Met:	2
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	18 Months
Estimated Time Required for Project Implementation:	18 Months	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Build floodwall around library	\$50,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to flood wall
	Relocate library	\$2,000,000+	Costly and may not solve problem
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 study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood damage to Library
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	1	
Legal	1	Borough would need to work with Essex County to implement project.
Fiscal	1	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts.
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:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell will gather data and submit an HMA Grant to request funding to fund a flood study along the corridor and based on the results of the study will implement the best alternative.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD by Study	Estimated Benefits (losses avoided):	Reduction in flood risk to structures along Bloomfield Ave Corridor
Useful Life:	TBD by Study	Goals Met:	2, 6
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	3 Years
Estimated Time Required for Project Implementation:	3 Years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering/OEM	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to roadways
	Install green stormwater infrastructure throughout the entire Bloomfield Avenue Corridor	\$2,000,000+	Costly and may not solve problem
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 study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood risk to structures along Bloomfield Ave corridor
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	1	
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Various streams run through Caldwell and flood during high intensity rain events leading to property damage.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding and implement the best identified alternative.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD by Study	Estimated Benefits (losses avoided):	Reduction in flood risk along streams throughout Borough
Useful Life:	TBD by Study	Goals Met:	2
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	3 Years
Estimated Time Required for Project Implementation:	3 Years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering/OEM	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Redirect streams	\$50,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to flood wall
	Install green stormwater infrastructure along these streams	\$2,000,000+	Costly and may not solve problem
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 study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood risk to structures along Bloomfield Ave corridor
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	1	
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Power line mitigation		
Project Number:	2020-Caldwell-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Utility Interruption		
Description of the Problem:	There are power lines in Caldwell which are above ground and vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct study to determine if specific areas have more occurrences of downed power lines than others, and work to bury power lines or focus tree trimming program on these areas.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Reduction in property damage, utility Interruption
Useful Life:	1 year for tree trimming, 50 years for burying lines	Goals Met:	2
Estimated Cost:	\$3 million per mile of buried line, \$5 for tree trimming	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, PDM, CHIPS
Responsible Organization:	Engineering	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
	Ask residents to alert township to dangerous trees.	\$1,000	Reactive. Likely to miss most trees.
	Remove all trees along areas with powerlines and property	N/A	Not feasible/environmentally damaging
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Power line mitigation	
Project Number:	2020-Caldwell-009	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Project will protect utilities from falling tree damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to conduct the project
Fiscal	0	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	Restore natural floodplain function
Total	9	
Priority (High/Med/Low)	High	



TOWNSHIP OF CEDAR GROVE

MUNICIPALITY AT A GLANCE

Total Population: **12,638**
 Total Land Area: **4.4 sq mi**
 Total # Buildings: **3,944**



1% Annual Chance Flood



29

Population Residing
in Floodplain



3

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$1.5 Million

Potential Building Damages



\$266 Thousand

Potential
Building Damages



0

Critical Facilities
in Floodplain

NFIP Statistics



37 # NFIP
Policies

2 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

Flood, Utility
Interruption

Project Types

Prevention, Property Protection,
Structural Projects, Emergency Services

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9.5 TOWNSHIP OF CEDAR GROVE

This section presents the jurisdictional annex for the Township of Cedar Grove. The annex includes a general overview of the Township of Cedar Grove; an assessment of the Township’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 Township of Cedar Grove’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	
Name / Title: Jeffrey McElroy, OEM Coordinator 525 Pompton Avenue, Cedar Grove NJ 07009 Phone Number: 973-264-5074 Email: jmcelroy@cedargrovepd.org		Name / Title: John D’Ascensio, Deputy OEM Coordinator 525 Pompton Avenue, Cedar Grove, NJ 07009 Phone Number: 973-239-1410 Email:	
NFIP Floodplain Administrator			
Name / Title: Alex Palumbo, Township Engineer 340 Little Falls Rd, Cedar Grove NJ 07009 Phone Number: 973-239-1410 Email: engineer@cedargrovenj.org			

9.5.2 Jurisdiction Profile

Cedar Grove became a Township in 1908. Cedar Grove started out as a small farming community. In 1985 the historic Morgan Farm was acquired by Cedar Grove (The Township of Cedar Grove, 2014). Cedar Grove operates under the Council-Manager form of municipal government. There is a five-member town council who are elected at-large every four years (The Township of Cedar Grove, 2014). According to the U.S. Census Bureau, the Township has a total land area of 4.378 square miles, of which 4.252 square miles is land and 0.126 square miles is water.

According to the U.S. Census, the 2010 population for the Township of Cedar Grove was 12,411. The estimated 2017 population was 12,638, a 1.8 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 3.9 percent of the population is 5 years of age or younger and 26 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 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.



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	7	3	2	4	80
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 and Mitigation if located in Hazard Zone
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 anticipated					

* Only location-specific hazard zones or vulnerabilities identified.

9.5.4 Capability Assessment

The Township of Cedar Grove 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.

Areas that mitigation is currently integrated are summarized in in this subsection. The Township of Cedar Grove 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 Cedar Grove.



Table 9.5-3. 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 and State	Yes	Yes/No	Yes/No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Township of Cedar Grove Construction Code, Chapter 119 as amended. Adopted 12-20-1976.</i>					
Zoning Code	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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. Township of Cedar Grove Zoning Code, Chapter 268, as amended. Adopted 06-25-2001. Chapter 268 Section 11 States that no permit shall be issued in the development of a property determined to contain steep slope areas and/or crest lines except in accordance with "Schedule of Steep Slope."</i>					
Subdivisions	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment: 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 234 Subdivision of Land, adopted 3-4-1963, administered by the Cedar Grove Planning Board and Zoning Board of Adjustment.</i>					
Stormwater Management	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 228 Stormwater Management, adopted 5-15-2006. The ordinance establishes minimum stormwater management requirements and controls for development.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes/No	Yes/No
<i>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.</i>					
Growth Management	No	-	Yes	-	-
<i>Comment: State mandated at local level.</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Chapter 268 Zoning Art X: Site Plan Approval.</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	Yes	2020-Cedar Grove-007
<i>Comment: Chapter 140 Flood Damage Prevention. Adopted by the Township Council of the Township of Cedar Grove 10-17-1988 by Ord. No. 88-324[1]; amended in its entirety 5-21-2007 by Ord. No. 07-672. Establishes Township Engineer as Floodplain Administrator.</i>					
Wellhead Protection	Yes	Local	No	-	-
<i>Comment: Chapter 265: Wells, Cisterns and Holes.</i>					



	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 #.
Emergency Management	Yes	-	-	-	-
<i>Comment: This ordinance outlines responsibilities and duties of emergency services personnel which includes execution of emergency directives. Chapter 23: Fire Department and Chapter 55 Police Department in the Township Municipal Code.</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Master Plan includes Environmental Resource Inventory, Open Space Element, Housing Plan Element, and Fair Share Plan.</i>					
Capital Improvement Plan	No	Local	Allowed	Yes/No	Yes/No
<i>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.</i>					
Disaster Debris Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Floodplain or Watershed Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Stormwater Management Plan	Yes/No	Local and State	Yes	Yes/No	Yes/No
<i>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 Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Cedar Grove ("the Township") to address stormwater-related impacts. The creation of this plan is required by N.J.A.C 7:14A-25 – municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C 7:8 Storm water Management Rules. 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 or result in 1/4 acre of new impervious surface. 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.</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment: Stormwater Pollution Prevention Plan</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	No	-	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 #.
<i>Comment:</i>					
Shoreline Management Plan	No	-	No	-	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	Yes	Local	No	-	-
<i>Comment: Community Forest Management Plan</i>					
Transportation Plan	No	-	No	-	-
<i>Comment:</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	No	-	No	-	-
<i>Comment:</i>					
Other	No	-	No	-	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>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.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	Local	No	-	-
<i>Comment:</i>					
Continuity of Operations Plan	No	Local	No	-	-
<i>Comment:</i>					
Public Health Plan	No	-	No	-	-
<i>Comment:</i>					
Other	No	-	No	-	-
<i>Comment:</i>					



Table 9.5-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes, Planning/Zoning
- If no, who does? If yes, which 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, Master Plan or Tax Assessor

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Cedar Grove.

Table 9.5-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning/Zoning Department, Planning Board, and Zoning Board of Adjustment
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission (Found in Chapter 47 of Cedar Grove Code)
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle
Maintenance program to reduce risk	Yes	Stream Cleaning, Culvert Cleaning, Catch-basin clearing, Vegetation Management. The Parks Department routinely circulates throughout the Township, neighborhood by neighborhood, pruning and/or removing dead Township trees.
Mutual aid agreements	Yes	Surrounding Communities, County, State
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Cedar Grove DPW
Engineers or professionals trained in building or infrastructure construction practices	Yes	Cedar Grove DPW
Planners or engineers with an understanding of natural hazards	Yes	Cedar Grove DPW
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	-
Surveyors	Yes	Engineering (Consultant)



Staff/Personnel Resource	Available?	Department/Agency/Position
Stormwater engineer	Yes	Engineering
Personnel skilled or trained in GIS applications	Yes	Cedar Grove DPW (Some Capability)
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Township of Cedar Grove Office of Emergency Management
Grant writers	Yes	Employees write grants on behalf of their own department.
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other		

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Cedar Grove.

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	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes (Water and Sewer)
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 Township of Cedar Grove.

Table 9.5-7. 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?	No
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes, Nixle, Facebook, Municipal Website



Criterion	Response
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes, Environmental Committee
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes, Nixle, Facebook, Municipal Website
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes, Nixle, Facebook, Municipal Website

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Cedar Grove.

Table 9.5-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	NP	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Unknown	-	-
Public Protection (Fire ISO Protection Class)	Yes	Possibly 3 or 4	
Storm Ready Certification	NP	-	-
Firewise Community Classification	NP	-	-
Sustainable Jersey	Yes	Bronze	10/4/2017

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 climate change and the jurisdiction’s rating.

Table 9.5-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood (riverine / flash flood, SLR)	Medium
Geological Hazards (landslides and subsidence/sinkholes)	Medium
Severe Weather (high wind, tornado, TSTM, and hail)	Medium
Severe Winter Weather (heavy snow, blizzards, and ice storms)	Medium
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Power Outages	Medium
Terrorism	Medium
Transportation Failure	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 9.5-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Township Engineer
Who is your floodplain administrator? (name, department/position)	Township 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?	05-21-2007
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> 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? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
<input type="checkbox"/> If so, what type of assistance/training is needed?	
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	No, not interested in joining
How many flood insurance policies are in force in your jurisdiction?*	Policies in force: 37 Insurance in force: \$8,744,000 Premium in force: \$51.44
How many total loss claims have been filed in your jurisdiction?*	Total loss claims: 21 3 Claims Open; 8 CWOP Total payments for losses: \$211,068.05
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

ADDITIONAL AREAS OF EXISTING INTEGRATION





Engineering Department: The Cedar Grove Engineering Department addresses engineering needs of the Township and is also the lead agency for the Municipal Stormwater Management Plan (MSWMP) which includes goals related to hazard mitigation including to:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater 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 in-stream structures;
- protect public safety through the proper design and operation of stormwater basins.

Road Department: The Road Department spreads salt and snowplows the Township's public roadways during winter storms. This helps to reduce risk of transportation accidents and reduce the impacts of severe winter weather events.

Environmental Commission: The Environmental Commission provides information and expertise to municipal boards, the Town Council, and general public on various environmental issues.

Health Department: The Cedar Grove Health Department is committed to protecting the health of all residents through organized community services. The Department works on public health preparedness planning.

Sustainable Jersey: The Township participates in the Sustainable Jersey program and is a bronze certified community. Actions related to hazard mitigation that resulted in points towards certification included:

- *Environmental Commission Site Plan Review:* The Cedar Grove Environmental Commission reviews all site plans that go before the Planning Board
- *Tree Protection Ordinance:* The Township's Tree Protection Ordinance was implemented in the 1980s.
- *Tree Maintenance Programs:* Cedar Grove's Department of Public Works (DPW) engages in a yearly tree maintenance program for maintaining mature trees, and as well as performs hazard pruning for actual or potential safety hazard for people, structures and traffic.

9.5.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Cedar Grove's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County; refer to Appendix E (Risk Assessment Supplement). Table 9.5-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.



Table 9.5-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.	Although the county was impacted, the township did not report damages.
July 1, 2016	Thunderstorm Wind	N/A	A passing cold front triggered a few severe thunderstorms over northeast New Jersey.	A large tree was uprooted onto 3 cars and a home in Cedar Grove. \$45K in property damages were reported.

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 9.5-12 summarizes the Township of Cedar Grove risk assessment results and data used to determine the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 9.5-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,473,359	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$7,912,578	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	2,411	NEHRP D&E:	740	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$1,941,799	
						2,500-year Loss:	\$33,539,291	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	3,289	Physical 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.		Low
		Population Below Poverty Level:	242					
Flood	100- and 500-Year Mean Return Period Event	100-year	29	100-year	9	100-year Loss:	\$265,734	High
		500-year	29	500-year	9			
Geological		Class A:	25	Class A:	8	Class A:	9889827.081	Moderate



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
		Class B:		Class B:		Class B:		
	High Landslide Susceptibility Areas	Class B:	114	Class B:	35	Class B:	\$31,804,607	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	62	Wildfire:	19	Wildfire:	\$32,371,269	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Cedar Grove.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: *Unknown*

Note: The number of SRL properties excludes RL properties.

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).

CRITICAL FACILITIES AND LIFELINES

No identified critical facilities or lifelines in the community are located in the 1-percent and 0.2-percent.

Table 9.5-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
None				

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Education is needed for residents during storm events.
- Park Ridge (near CVS) floods from rain and runoff.
- West Lindsley Road experiences considerable runoff from heavy rain, but there is also a lot of runoff from winter thaws. The road is county owned.
- There are two repetitive loss properties located in the township. These properties have been repeatedly damaged by flooding.
- The area between Bowdown and Grove Avenue on Route 23 floods from heavy rainfall, runoff, and the river. This area is in the center of Cedar Grove and includes commercial structures.
- Taylor's Brook, behind Town Hall, overtops during extreme storms.
- Previous instances of interruption of water supply have put a strain on municipal resources.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Cedar Grove 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 Cedar Grove has significant exposure. Figures 9.5-1 and 9.5-2 illustrate the hazard area extent and locations in the Township. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 Cedar Grove. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Cedar Grove has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect and adjust 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 calculated hazard ranking for flood from low to high.
- The Township changed the calculated hazard ranking for wildfire from low to medium.
- The Township changed the calculated hazard ranking for terrorism from low to medium.

Table 9.5-14. Township of Cedar Grove Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	High	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	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 9.5-15. 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 #
Cedar Grove-1: Obtain generators at Cedar Grove critical facilities to maintain continuity of operations and service the residents in times of hazard events. The following have been identified as locations to date: Upgrade Town Hall and new generator for Fire House Company 3 and Municipal Library	Township of Cedar Grove	Town Hall Completed March 2019, Company 3 under construction, Library designs are completed by waiting on funding.	X	2020-Cedar Grove-001
Cedar Grove-2: 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: <ul style="list-style-type: none"> •Providing general natural hazard risk, preparedness and mitigation in regular newsletter and mailings and website. •Including natural hazard risk and risk reduction information through social media channels and email blast systems. •Developing/maintaining a natural hazard risk management webpage on the municipal website where information and mapping can be posted. 	Supervisor's Office	Ongoing - Basic Emergency Preparedness Information	X	2020-Cedar Grove-008

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Cedar Grove participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Cedar Grove participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.5-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Cedar Grove 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.5-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.5-18 summarizes the actions by type across hazards of concern.



Table 9.5-16. 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-Cedar Grove-001	Obtain backup power for Fire House Company 3 and the Municipal Library	Cedar Grove critical facilities need to maintain continuity of operations in order to service the residents in times of hazard events.	The following have been identified as locations to date: Generator for Fire House Company 3 and Municipal Library	Existing	Utility interruption	2, 6	<u>Township of Cedar Grove</u>	FEMA Hazard Mitigation Grant Program, Township budget	Preserves continuity of operations	\$50,000	Within 3 years	High	SIP	PP, ES
2020-Cedar Grove-002	Flood study for Park Ridge	Park Ridge (near CVS) floods from rain and runoff.	Complete Flood Study to assess options for flood reduction.	Existing	Flood	2	<u>Engineering</u>	HMGP, BRIC, municipal budget	Reduction in flooding	TBD by flood study	5 years	Medium	LPR, SIP	SP
2020-Cedar Grove-003	Mitigate flood-prone properties, including RL/SRL properties	There are 2 repetitive loss properties located in the Little Falls Road area of the Township. These properties have been repeatedly damaged by flooding.	The Township will conduct public outreach to the RL and SRL properties to identify if there is interest in mitigation (elevation or acquisition). If there is no interest in mitigation, the Township will provide a list of options homeowners	Existing	Flood	1, 2, 3	<u>Floodplain Administrator</u>	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.	\$3 Million	3 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
			can do to protect their home from future flood damage											
2020-Cedar Grove-004	Cooperate with Essex County to develop strategy to reduce W Lindsley Road flooding	W Lindsley Road there is considerable runoff from heavy rain, but there is also a lot of runoff from winter thaws. The road is county owned.	Cedar Grove engineering will work with Essex County to determine a solution to reduce runoff on W Lindsley Road and ultimately reduce flood impacts.	Existing	Flood	2	<u>Engineering</u> , Essex County	County	Reduction in flooding	TBD by flood study	Within 5 years	Medium	LPR, SIP	SP
2020-Cedar Grove-005	Flood study for Bowdown and Grove Avenue on Route 23	Between Bowdown and Grove Ave on Rt 23. (Center of Cedar Grove. Floods from heavy rainfall, runoff, and the river. Commercial structures. Behind Town Hall is Taylor's Brook overtops during extreme storms	Develop application for Flood Study and implement best alternative. USACE has previously dredged the Peckman near Little Falls Road.	Existing	Flood	2	<u>Engineering</u>	HMGP, BRIC, municipal budget	Reduction in flooding	TBD by flood study	5 years	Medium	LPR, SIP	SP
2020-Cedar Grove-006	Feasibility study for shared water services	Previous instances of interruption of water supply	Cedar Grove will pursue a feasibility study to	Existing	Utility interruption	2, 6	<u>Cedar Grove Engineering</u> , Water Department,	Municipal budget	Shared services agreement established.	TBD by agreement	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
		have put a strain on municipal resources by having to	determine if a connection with surrounding municipalities can be made for shared water service during periods of outage.				Township Administration		Utility interruptions reduced.					
2020-Cedar Grove-007	Update Flood Damage Prevention Ordinance to include freeboard	The current ordinance lacks the state required freeboard.	Update ordinance to include 1 foot of freeboard.	New and Existing	Flood	5	<u>FPA</u>	Municipal budget	Meeting state standards	\$100	Within 6 months	High	LPR	PR
2020-Cedar Grove-008	All Hazards Education and Outreach	Cedar Grove currently provides basic emergency preparedness information but does not provide information on hazard mitigation and risk reduction.	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. This program will include: •Providing general natural hazard risk, preparedness	N/A	Earthquake, Severe Storms, Severe Winter Weather	5	<u>Cedar Grove OEM</u> , Cedar Grove Administration	Municipal Budget	Increased public awareness	Low	Within 5 Years	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
			and mitigation in regular newsletter and mailings and website. •Including natural hazard risk and risk reduction information through social media channels and email blast systems. •Developing/ maintaining a natural hazard risk management webpage on the municipal website where information and mapping can be posted.											

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

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.





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 9.5-17. 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-Cedar Grove-001	Obtain backup power for Fire House Company 3 and the Municipal Library	1	1	0	1	1	1	0	1	1	1	0	0	1	1	10	High
2020-Cedar Grove-002	Flood study for Park Ridge	0	1	0	1	1	1	0	1	0	0	1	0	1	1	8	Medium
2020-Cedar Grove-003	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-Cedar Grove-004	Cooperate with Essex County to develop strategy to reduce W Lindsley Road flooding	0	1	0	1	1	0	0	1	0	0	1	0	1	1	7	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-Cedar Grove-005	Flood study for Bowdown and Grove Avenue on Route 23	0	1	0	1	1	1	0	1	0	0	1	0	1	1	7	Medium
2020-Cedar Grove-006	Feasibility study for shared water services	1	0	0	1	1	1	1	1	1	1	0	1	1	1	11	High
2020-Cedar Grove-007	Update Flood Damage Prevention Ordinance to include freeboard	0	1	1	1	1	1	1	0	1	1	0	1	1	1	11	High
2020-Cedar Grove-008	All Hazards Education and Outreach	1	1	0	1	1	1	1	1	1	1	0	0	1	1	11	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.5-18. 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 Erosion and Sea Level Rise								
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-Cedar Grove-007	2020-Cedar Grove-003				2020-Cedar Grove-002, 2020-Cedar Grove-004, 2020-Cedar Grove-005		
Geological Hazards (landslides and subsidence/sinkholes)								
Severe Weather (high wind, tornado, TSTM, and hail)								
Severe Winter Weather (heavy snow, blizzards, and ice storms)								
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption	2020-Cedar Grove-006	2020-Cedar Grove-001			2020-Cedar Grove-001			
Terrorism								
Transportation Failure								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.



9.5.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Cedar Grove 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. . In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.5-19. Contributors to the Annex

Entity	Title	Method of Participation
Jeffrey McElroy	OEM Coordinator, Cedar Grove Police Department	Primary POC, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
John D-Ascensio	Deputy OEM Coordinator Address:	Alternate POC



Figure 9.5-1. Township of Cedar Grove Hazard Area Extent and Location Map

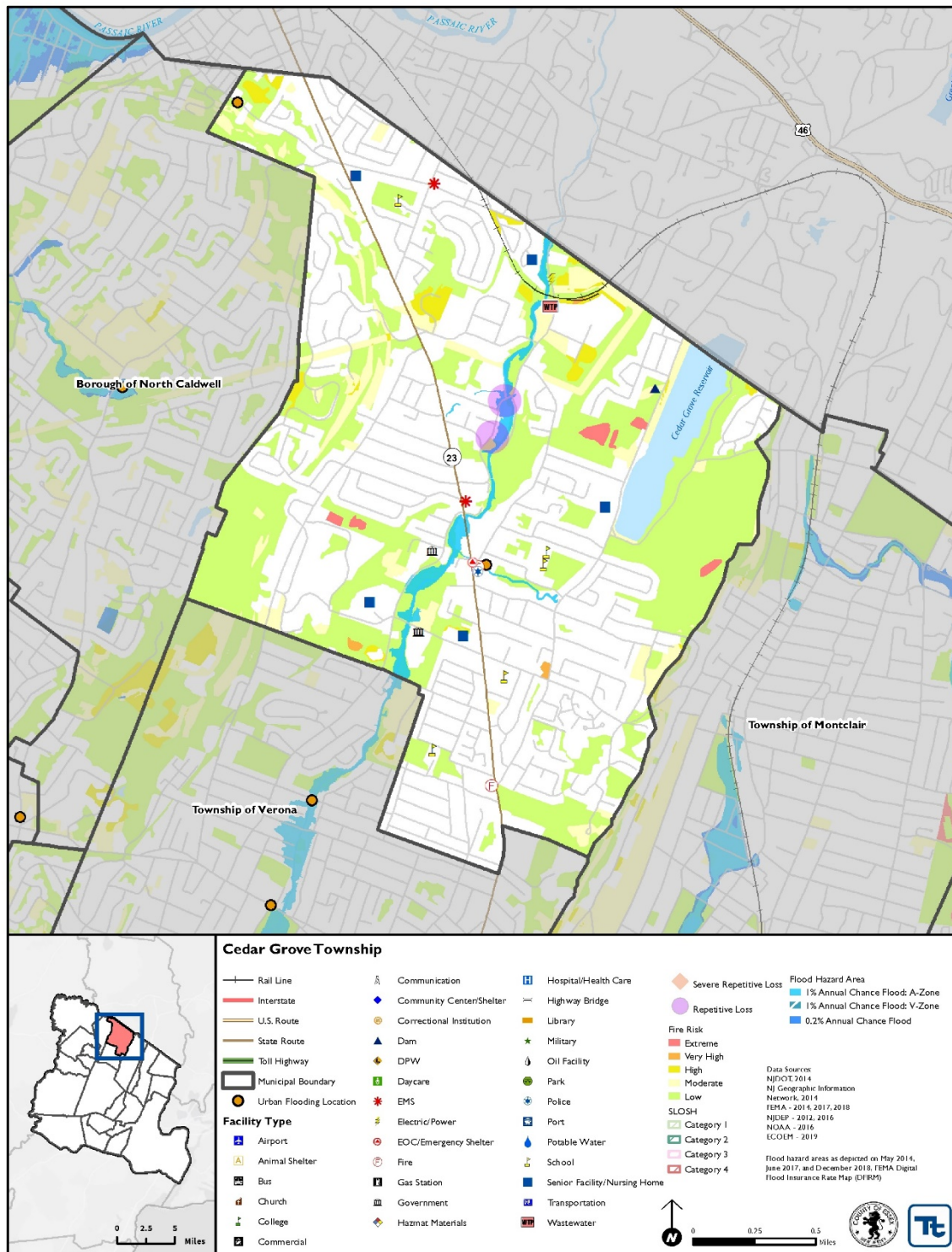
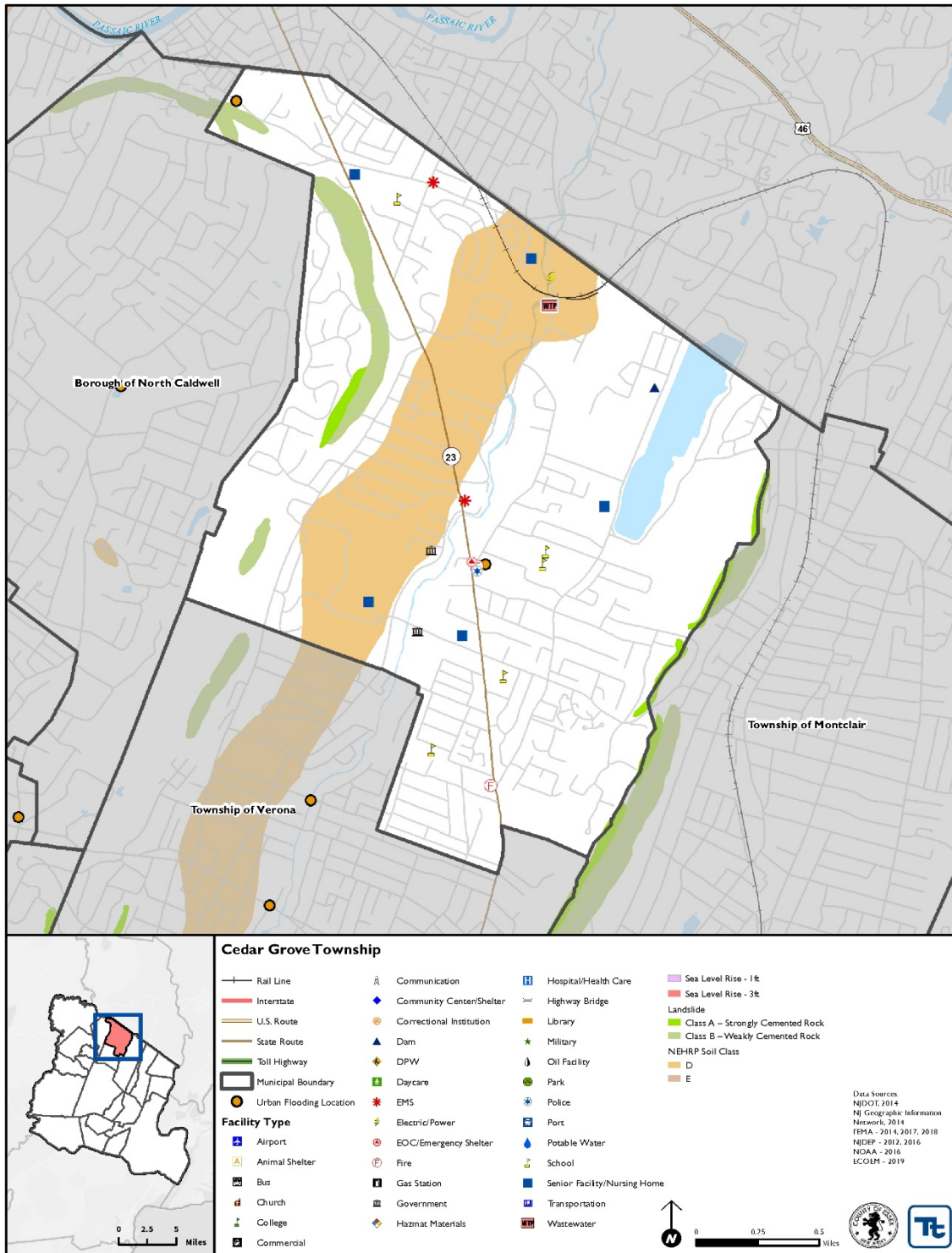




Figure 9.5-2. Township of Cedar Grove Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Flood study for Park Ridge		
Project Number:	2020-Cedar Grove-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Park Ridge (near CVS) floods from heavy rainfall and runoff.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a flood study to determine the source of the flooding problem. Implement drainage solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by flood study	Goals Met:	2
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	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:	Flood study for Park Ridge	
Project Number:	2020-Cedar Grove-002	
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 Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Flood study for Bowdown and Grove Avenue on Route 23		
Project Number:	2020-Cedar Grove-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Between Bowdown and Grove Ave on Rt 23. (Center of Cedar Grove. Floods from heavy rainfall, runoff, and the river. Commercial structures. Behind Town Hall is Taylor's Brook overtops during extreme storms		
Action or Project Intended for Implementation			
Description of the Solution:	Develop application for Flood Study and implement best alternative to reduce flooding. USACE has previously dredged the Peckman near Little Falls Road.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by flood study	Goals Met:	2
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	Costly and may not solve problem
	Relocate roadways and buyout commercial properties	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:	Flood study for Bowdown and Grove Avenue on Route 23	
Project Number:	2020-Cedar Grove-005	
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 Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Cedar Grove-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the Little Falls Road area. 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 2 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 Little Falls Road area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard (<i>in accordance with flood ordinance</i>)	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, 3
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:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:		
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 Little Falls Road area of Town.
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	



CITY OF EAST ORANGE

MUNICIPALITY AT A GLANCE

Total Population: **65,151**
 Total Land Area: **3.9 sq mi**
 Total # Buildings: **7,908**



1% Annual Chance Flood



349

Population Residing
in Floodplain



74

Persons That
May Seek Shelter



\$9.6 Million

Potential
Building Damages



0

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$4.6 Million

Potential Building Damages

NFIP Statistics



76 # NFIP
Policies

3 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

Earthquake, Flood,
Geological, Severe
Weather, Winter Storm,
Wildfire, Utility Interruption

Project Types

Property Protection, Public
Education/Awareness, Emergency
Services, Structural Projects,
Community Capacity Building

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9.6 CITY OF EAST ORANGE

This section presents the jurisdictional annex for the City of East Orange. The annex includes a general overview of the City of East Orange; an assessment of the City of East Orange’s risk and 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.

9.6.2 Hazard Mitigation Planning Team

The following individuals are the City of East Orange’s identified hazard mitigation plan 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: Solomon Steplight, OEM Coordinator Address: 44 City Hall Plaza, East Orange NJ, 07018 Phone Number: 973-266-5310 Email: Solomon.Steplight@eastorange-nj.gov	Name / Title: R. David Williams, Deputy OEM Coordinator Address: 402 Springdale Ave. East Orange NJ, 07018 Phone Number: 973-266-5507 Email: David.Williams@eastorange-nj.gov
NFIP Floodplain Administrator	
Name / Title: Christopher Coke, Director of Public Works Address: 44 City Hall Plaza, East Orange NJ, 07018 Phone Number: 973-266-5330 Email: Christopher.Coke@eastorange-nj.gov	

9.6.3 Jurisdiction Profile

The City of East Orange separated from Orange in 1863 (City of East Orange, 2014). The East Orange Public Library system once included three of the thirty-six Carnegie-funded libraries in New Jersey. Parts of East Orange fall into an Urban Enterprise Zone where purchases made at specific merchants are taxed at 3.5 percent instead of the statewide 7 percent. According to the U.S. Census Bureau, the City has a total land area of 3.924 square miles, of which 3.924 square miles is land and 0 square miles is water.

According to the U.S. Census, the 2010 population for the City of East Orange was 64,270. The estimated 2017 population was 65,151, which is a 1.4 percent increase in population from 2010. Data from the 2017 U.S. Census American Community Survey estimates that 6.4 percent of the City population is five years of age or younger, and 12.7 percent is 65 years of age or older. 24 percent of the population is estimated to be below the poverty line. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

The City of East Orange has operated under a Mayor-Council form of government since being established by a special Charter in 1909 (City of East Orange, 2014).

9.6.4 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. Refer to Figure 9.6-1 at the end of this annex which illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

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	0	4	2		0
Multi-Family	0	1	5	3	3
Other (commercial, mixed-use, etc.)	0	5	3	3	3
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 anticipated					

* Only location-specific hazard zones or vulnerabilities identified.

9.6.5 Capability Assessment

The City of East Orange performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. 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 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 East Orange.

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 / 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 and State	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 #.
<i>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 East Orange Building Department.</i>					
Zoning Code	Yes	Local and State	Yes	-	-
<i>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 50, Updated 2013. Administered by the Planning Department.</i>					
Subdivisions	Yes	Local and State	Yes	-	-
<i>Comment: 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 50, Updated 2013. Administered by the Planning Department.</i>					
Stormwater Management	Yes	Local	Yes	-	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Ordinance #15, adopted NJ DEP rules. Administered by the Department of Public Works.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	-	-
<i>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.</i>					
Growth Management	No	-	Yes	-	-
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	-	-
<i>Comment: Chapter 50. Administered by the Planning Department.</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	-	-
<i>Comment: Chapter 150 Floodplain Management adopted 1988. Administered by the City Construction Official.</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment: Regulatory requirements related to wells are managed through NJDEP</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	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 #.
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: East Orange Master Plan, 2018. The Master Plan contains Elements on Demographics, Land Use, Economic Development, Circulation, Housing, Community Facilities, Sustainability, Recycling, Historic Preservation, and a Parks Master Plan. Information is included on storm resiliency, smart growth, and environmental sustainability in the Land Use Element. Transportation failure is discussed in the Circulation element. The Sustainability element discusses the differences between sustainability and resiliency and covers green stormwater infrastructure.</i>					
Capital Improvement Plan	No	-	Allowed	-	-
<i>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.</i>					
Disaster Debris Management Plan	Yes	Local	No	-	-
<i>Comment: Debris Management Plan</i>					
Floodplain or Watershed Plan	No	-	No	-	-
<i>Comment:</i>					
Stormwater Management Plan	No	Local and State	Yes	-	-
<i>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).</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	-	-
<i>Comment:</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	Yes	Local	No	Yes	-
<i>Comment: Economic Development element of Master Plan. 2018.</i>					
Shoreline Management Plan	No	-	No	-	-
<i>Comment:</i>					



	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 #.
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	-	-
<i>Comment:</i>					
Transportation Plan	Yes	Local	No	Yes	-
<i>Comment: Circulation element of Master Plan. 2018.</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	Yes	Local	No	Yes	-
<i>Comment: Sustainability element of Master Plan. 2018.</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	Yes	-	No	Yes	-
<i>Comment: Economic Development element of Master Plan. 2018.</i>					
Other	No	-	No	-	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	-	-
<i>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. Comprehensive Emergency Management Plan 2013 Administered by Emergency Management.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	-	No	-	-
<i>Comment:</i>					
Continuity of Operations Plan	Yes	Local	No	-	-
<i>Comment: Within CEMP.</i>					
Public Health Plan	Yes	Local	No	-	-
<i>Comment: Administered by Health and Human Services</i>					
Other	No	-	No	-	-
<i>Comment:</i>					



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 Department
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.	Yes. The City maintains City owned property list by lot size, structure, and zone.



ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the City of East Orange.

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	LEPC
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Recreation & Cultural Affairs, Municipal Recreation and Open Space Advisory Board
Economic Development Commission / Committee	Yes	Economic Development Division of Department of Policy, Planning and Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, social media
Maintenance program to reduce risk	Yes	Public Works - Shade Tree
Mutual aid agreements	Yes	Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	Public Works
Planners or engineers with an understanding of natural hazards	Yes	Public Works
Staff with training in benefit/cost analysis	Yes	City Administrator
Surveyors	Yes	Public Works
Personnel skilled or trained in GIS applications	Yes	Public Works
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Emergency Management
Grant writers	Yes	Planning Department
Resilience Officer	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the City of East Orange.

Table 9.6-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes - Planning Department
Capital Improvements Project Funding	Yes - Finance Department
Authority to Levy Taxes for Specific Purposes	Yes - City Council
User Fees for Water, Sewer, Gas or Electric Service	Yes - Water Department
Incur Debt through General Obligation Bonds	Yes - City Council & Water Department
Incur Debt through Special Tax Bonds	Yes - Parking Department, Housing, and Water Commission
Incur Debt through Private Activity Bonds	Yes - City Council & Water Department
Withhold Public Expenditures in Hazard-Prone Areas	No





Financial Resource	Accessible or Eligible to Use?
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the City of East Orange.

Table 9.6-7. 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
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, LEPC
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: Reverse 911, Social Media

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the City of East Orange.

Table 9.6-8. 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	Class 2	May 2017
Storm Ready Certification	No	-	-
Firewise Community Classification	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 referred to while discussing climate change adaptation; however, it also provides 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.



Table 9.6-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Low
Earthquake	Low
Extreme Temperature	Low
Flood	Low
Geological Hazards	Low
Severe Weather	Medium
Winter Storm	Medium
Wildfire	Low
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Medium
Economic Collapse	Low
Hazardous Substances	Medium
Utility Interruption	Low
Terrorism	Medium
Transportation Failure	Low

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?	Property Maintenance
Who is your floodplain administrator? (name, department/position)	Christopher Coke, Director/DPW
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	1988
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?	10/31/2019
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?	No
<input type="checkbox"/> If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)?	No, not interested



Criterion	Response
<ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	
How many flood insurance policies are in force in your jurisdiction?* <ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	57 policies in force
How many total loss claims have been filed in your jurisdiction?* <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	57 claims; \$295,880 in total payments
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 3.31.2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

The following departments and offices in the City of East Orange integrate hazard mitigation through outreach and the enforcement of existing City policies and regulations.

- Property Maintenance:** The mission of the Department of Property Maintenance is to promote the appreciation, preservation and revitalization of East Orange's properties, communities and landscapes. To achieve its mission, the Department's team of hands-on professionals will provide prompt, courteous customer service focused on providing solutions to property maintenance concerns about residential, commercial, vacant, and abandoned properties.
- Office of Emergency Management:** The mission of the East Orange Office of Emergency Management is to provide effective and professional assistance to other city departments, the East Orange School District, Hospitals and private sector by aiding them in their planning and preparation for emergencies and by responding to incidents, consistent with the policies of the City of East Orange, Essex County Office of Emergency Management and the New Jersey State Police Office of Emergency Management. The East Orange Office of Emergency Management (OEM) coordinates the plans and operations of the various components of the emergency operations plan:
 - Community Emergency Response Team (CERT) volunteers
 - Emergency medical service
 - Emergency warning system
 - Fire
 - Police
 - Public health
 - Public information
 - Public works
 - And many other groups who assist during emergencies
- Office of Public Information:** The City of East Orange's Office of Public Information:
 - Fosters positive relationships with local and national media and provides timely, proactive and responsive information to media inquiries
 - Manages marketing and branding for all major citywide initiatives
 - Writes and copy edits external communications from the Mayor's Office
 - Actively promotes city projects, programs and initiatives using traditional and social media



9.6.6 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Volume I, Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles (Section 4.4) and includes a chronology of events that have affected Essex County and its jurisdictions. The City of East Orange’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.6-11 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. For details of these and additional events, refer to Volume I, Section 4 (Risk Assessment) of this plan.

Table 9.6-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	<p>Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.</p>	<p>Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. The storm resulted in scattered debris and damages and multiple power outages reported. By mid- afternoon all major roadways were cleared of snow and debris.</p>

Notes:

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. The following summarizes the hazards of greatest concern and risk to the City of East Orange. Table 9.6-12 summarizes the risk assessment results and information used to inform the hazard ranking.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the City of East Orange.





- Number of repetitive loss (RL) properties: 3
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Note: The number of SRL properties excludes RL properties.

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).



Table 9.6-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$4,641,046	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$36,595,336	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	1,469	NEHRP D&E:	282	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$4,678,812	
						2,500-year Loss:	\$77,459,497	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	8,254	Physical 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.		Low
		Population Below Poverty Level:	12,422					
Flood	100- and 500-Year Mean Return Period Event	100-year	349	100-year	50	100-year Loss:	\$9,633,804	High
		500-year	349	500-year	50			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2





CRITICAL FACILITIES AND LIFELINES

No identified critical facilities and lifelines in the community are located in the 1-percent and 0.2-percent floodplain.

Table 9.6-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Potential Loss from 1% Flood Event	
		1% Event	0.2% Event	Percent Structure Damage	Percent Content Damage
No critical facilities located in floodplain					

Note:
*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- The water pumping station in East Orange needs a backup generator and is an area prone to Utility Interruptions.
- The City has limited pumps, mobile generators, and fixed generators.
- The City has a limited number of trained personnel and inadequate equipment.
- Police pistol range is in flood prone area and has suffered repeated losses
- The City needs a water tender/tanker to supply water during an emergency.
- The Johnnie L. Cochran Jr. Academy Elementary School is located in a NEHRP soils D&E zone.
- There are three NFIP repetitive loss properties located in East Orange.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps have been generated for the City of East Orange 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 considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the City of East Orange has significant exposure.

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 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as 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 Hudson 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 East Orange. The City of East Orange has reviewed the 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 calculated hazard ranking of flood from low to high.
- The City changed the calculated hazard ranking of cyber-attack from low to high.
- The City changed the calculated hazard ranking of transportation failure from low to high.

Table 9.6-14. City of East Orange Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	High	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	High

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Low	High

9.6.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their 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 9.6-15. 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 #
East Orange -1: "Obtain sources of backup power for critical facilities to ensure continuity of operations. The following are currently identified: 1. East Orange Fire Station 2 generator 2. East Orange Fire Station 3 generator	East Orange OEM	In Progress	X	2020-East Orange-006





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 #
3. East Orange Fire Station 5 generator 4. East Orange City garage generator"				
East Orange-2: Reconstruction of Second River channel walls; design phase funded for replacement channel structure, construction unfunded	Department of Public Works	No Progress (funding shortage of \$1.5million)	X	East Orange-007
East Orange-3: Continue to have dialog with NJ Transit to address parking capacity, address flooding of train station viaducts and underpasses	Engineering	No Progress	X	2020-East Orange-008
East Orange-4: Evaluate Stormwater capacity City wide and develop mitigation actions to address flooding in areas of: (list areas) 2008 Roadway infrastructure action revised	Engineering	Ongoing		
East Orange-5: 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: •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 City 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.	City Supervisor's Office	Ongoing		
East Orange-6: Develop and implement a post-event damage assessment program, including the following elements: •Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property	East Orange OEM	Completed		





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 #
damage and obtain required permitting when making repairs. <ul style="list-style-type: none"> Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the City (e.g. building permit process). 				
East Orange-7: Enhance/expand tree maintenance program (under contract with current vendor) and coordination with PSEG utility.	Engineering	Completed		
East Orange-8: Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	East Orange	Completed/ Maintained		

The City did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The City of East Orange participated in a risk assessment workshop in September 2019 where detailed information was provided on assets exposed and vulnerable to the identified hazards of concern. The City of East Orange was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Hudson 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). Refer to Section 6 and Appendix H (Mitigation Strategy Supplement) for a more complete description of the Mitigation Toolbox and its resources.

Table 9.6-16 summarizes the comprehensive-range of specific mitigation initiatives the City of East Orange would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for





each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ Table 9.6-17 provides a summary of the prioritization of all proposed mitigation initiatives and Table 9.6-18 summarizes the actions by type across hazards of concern.



Table 9.6-16. 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-East Orange-001	Backup generator for water pumping station	Water pumping station lacks backup power	The city will purchase and install a backup generator for the water pumping station	Existing	Utility Interruption	6	Public Works	Municipal budget, HMGP	Water supply maintained	\$75,000	Within 5 years	High	SIP	PP
2020-East Orange-002	Develop plan to acquire emergency equipment	The city has limited pumps, mobile generators, and needs a water tender/tanker .	The city will develop a plan to identify how many standby pumps and generators are needed to service high priority areas and fund the purchase of equipment. The city will also purchase a water tender/tanker .	N/A	Utility Interruption , Flood, Severe Storm, Severe Winter Storm, Wildfire	5	<u>OEM</u> , Public Works	Municipal budget, HMGP, Assistance to Fire Fighters Grant Program	Staff have appropriate equipment for emergencies.	TBD by results of planning period	Within 5 years	High	SIP	ES
2020-East Orange-003	Feasibility assessment for police pistol range	The police pistol range is located in a flood prone area and has suffered	The city will conduct a feasibility assessment to determine the best mitigation	Existing	Flood	2	<u>FPA</u> , Police Department	Municipal budget, PDM, HMGP	Future damages avoided	TBD by selected action	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
		repeated losses.	action (floodproof, elevate, relocate) to protect the range and implement the identified action.											
2020-East Orange-004	Outreach to Johnnie L. Cochran Jr. Academy Elementary School.	The Johnnie L. Cochran Jr. Academy Elementary School is located in a NEHRP soils D&E zone.	The city will contact the school facility manager to alert them of the school's location in the D&E zone and discuss possible mitigation actions.	Existing	Earthquake , Geological Hazard	1, 2, 3	City of East Orange	Municipal budget	Facility manager made aware of risk and educated.	\$100	Within 1 year	High	EA P	PI
2020-East Orange-005	Mitigate flood-prone properties, including RL properties	There are three NFIP repetitive loss properties located in East Orange.	The city will conduct outreach to 15 flood-prone property owners including RL properties and help identify funding for mitigation.	Existing	Flood	2	FPA	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.	\$1.5 Million	3 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
2020-East Orange-006	Obtain sources of backup power for critical facilities to ensure continuity of operations	The following are currently identified as lacking backup power sources: 1. East Orange Fire Station 2 2. East Orange Fire Station 3 3. East Orange Fire Station 5 4. East Orange City garage	The city will obtain sources of backup power for critical facilities to ensure continuity of operations. The following are currently identified: 1. East Orange Fire Station 2 generator 2. East Orange Fire Station 3 generator 3. East Orange Fire Station 5 generator 4. East Orange City garage generator	Existing	Utility Interruption	6	East Orange OEM	HMGP, municipal budget	Critical services maintained	\$120,000	5 years	High	SIP	ES
2020-East Orange-007	Reconstruction of Second River channel walls	Second River channel walls are degraded. The design phase is already	Reconstruction of Second River channel walls; design phase funded for replacement	Existing	Flood	1, 2	Department of Public Works	HMGP, FMA	Channel wall failure reduced. Flood risk reduced.	\$1.5 million	5 years	High	SIP	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
		funded for replacement channel structure.	channel structure.											
2020-East Orange-008	Work with NJ Transit to address flooding	Train station viaducts and underpasses are prone to flooding	Continue to have dialog with NJ Transit to address parking capacity, address flooding of train station viaducts and underpasses	Existing	Flood, Severe Storm, Transportation Failure	1, 2, 6	Engineering	NJ Transit	Flood risk to NJ Transit facilities reduced	\$500 for staff time	5 years	High	SIP	PP
2020-East Orange-008	Outreach program expansion	Additional outreach is needed for cyber-attack.	Expand existing outreach to include information on cyber-attack.	N/A	Cyber Attack	1, 2	East Orange OEM	Municipal budget	Increased awareness and personal protection.	\$1,000	Within 6 months	High	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. Such 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. These 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. Such 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 9.6-17. 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-East Orange-001	Backup generator for water pumping station	1	0	1	1	1	1	0	1	1	1	0	0	1	1	10	High
2020-East Orange-002	Develop plan to acquire emergency equipment	1	1	0	1	1	1	0	1	1	1	1	0	1	1	11	High
2020-East Orange-003	Feasibility assessment for police pistol range	0	1	1	1	1	1	0	1	1	1	0	0	1	1	10	High
2020-East Orange-004	Outreach to Johnnie L. Cochran Jr. Academy Elementary School.	1	1	1	0	1	0	1	1	1	1	1	1	0	1	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-East Orange-005	Mitigate flood-prone properties, including RL properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-East Orange-006	Obtain sources of backup power for critical facilities to ensure continuity of operations	1	1	0	1	1	1	0	1	1	1	0	0	1	1	10	High
2020-East Orange-007	Reconstruction of Second River channel walls	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-East Orange-008	Work with NJ Transit to address flooding	0	1	1	1	1	0	1	1	1	1	0	0	1	1	12	High
2020-East Orange-008	Outreach program expansion	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High

Note (1): Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

Note (2): Low (0-4), Medium (5-8), High (9-14).



Table 9.6-18. 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 Erosion and Sea Level Rise								
Coastal Storm								
Drought								
Earthquake			2020-East Orange-004					
Extreme Temperature								
Flood		2020-East Orange-003, 2020-East Orange-005, 2020-East Orange-008			2020-East Orange-002	2020-East Orange-007		2020-East Orange-008
Geological Hazards			2020-East Orange-004					
Severe Weather					2020-East Orange-002			
Winter Storm					2020-East Orange-002			
Wildfire					2020-East Orange-002			
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-East Orange-001			2020-East Orange-002, 2020-East Orange-006			
Terrorism								
Transportation Failure								

Refer to Section 6 (Mitigation Strategy) for an explanation of the mitigation categories.

9.6.9 Staff and Local Stakeholder Involvement in Annex Development

The City of East Orange followed the planning process described in Section 2 (Planning Process) in Volume I of this plan update. 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.6-19. Contributors to the Annex

Entity	Title	Method of Participation
Solomon Steplight	OEM Coordinator	Primary point of contact
David Williams	Deputy OEM Coordinator	Reviewed annex, provided impact data, contributed to the mitigation strategy.
Natasha Ortiz	Grants Management Assistant, Division of Grants, Office of the City Administrator	Reviewed annex, provided impact data, contributed to the mitigation strategy, reviewed the draft and provided comments.

Figure 9.6-1. City of East Orange Hazard Area Extent and Location Map

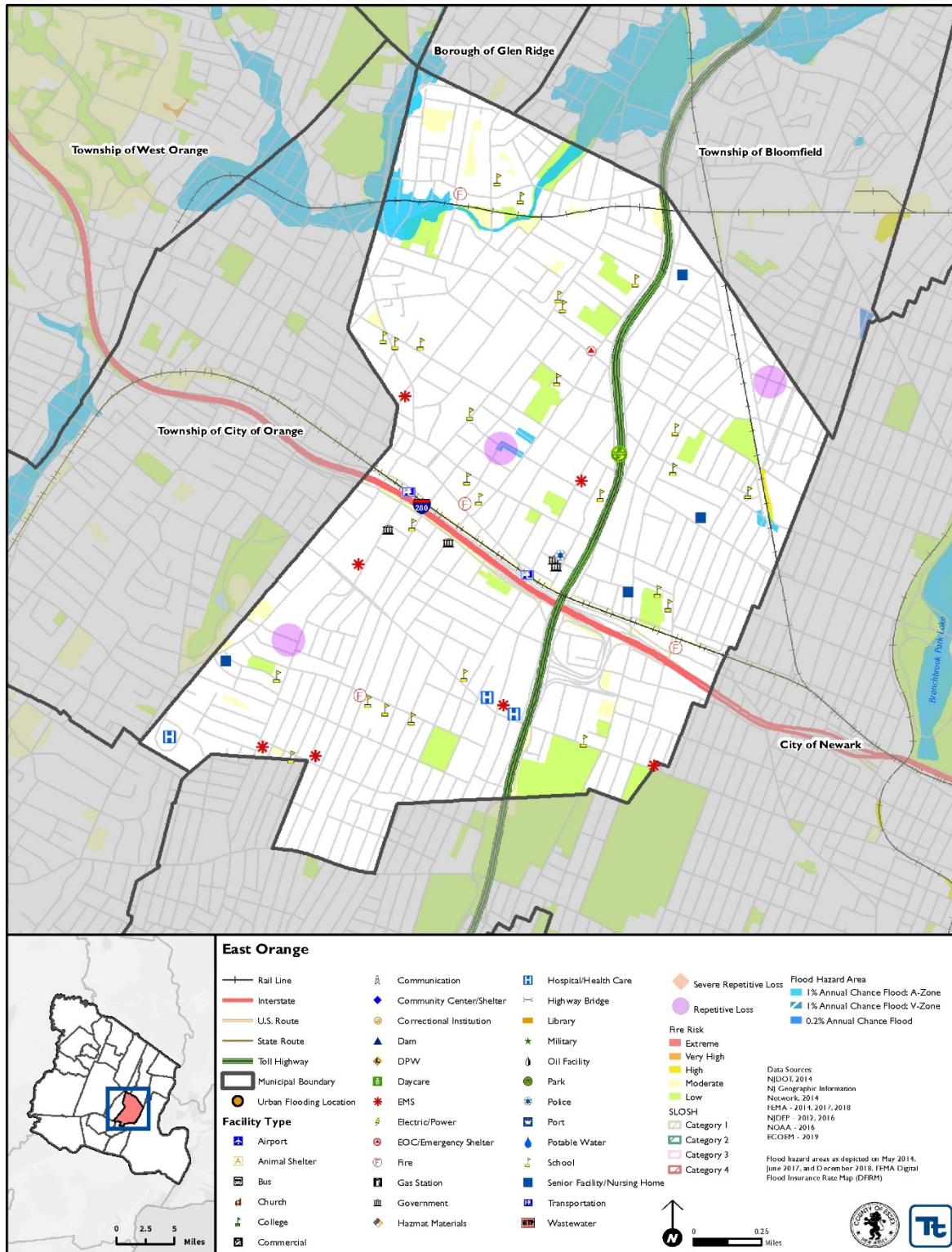
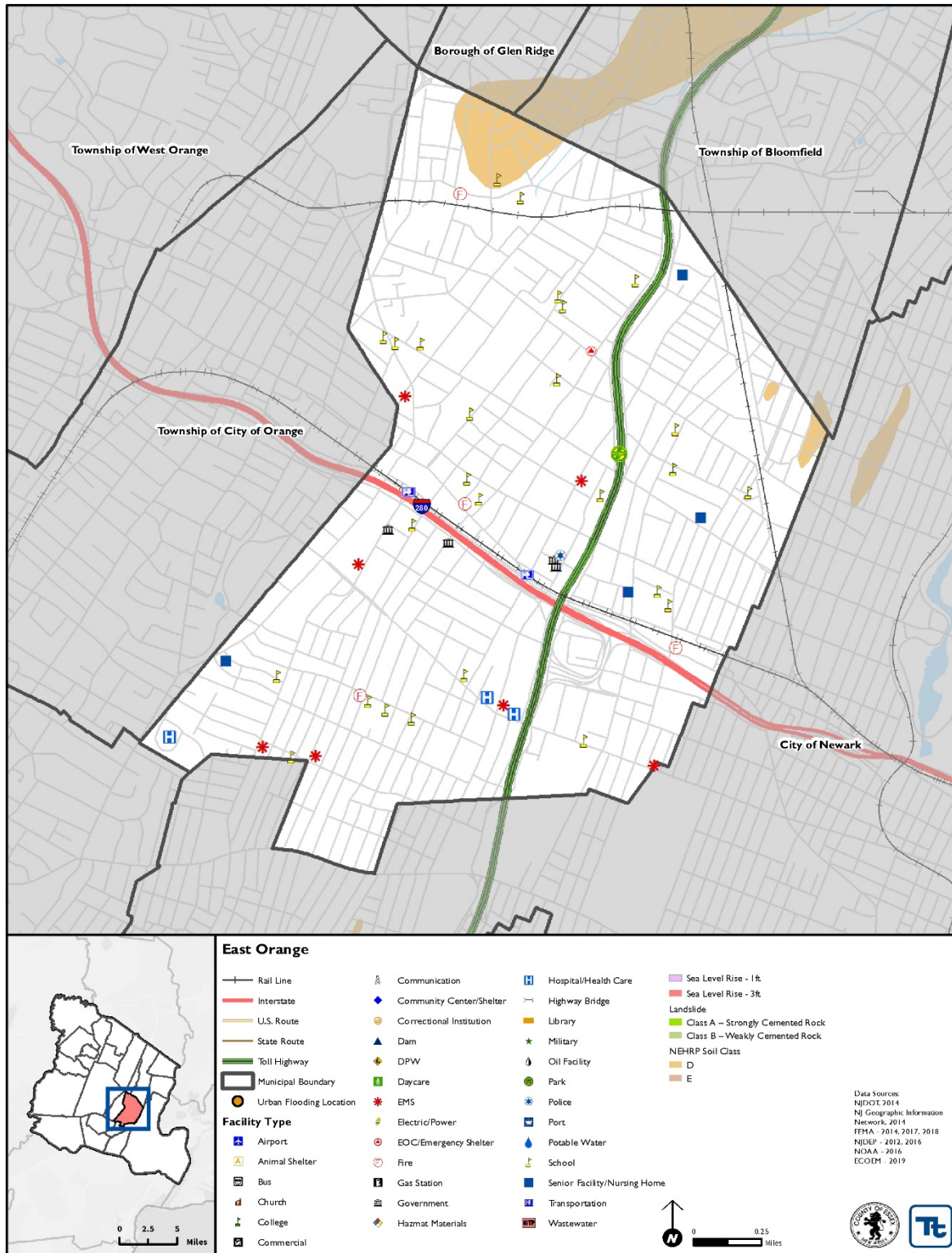




Figure 9.6-2. City of East Orange Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Feasibility assessment for police pistol range		
Project Number:	2020-East Orange-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The police pistol range is located in a flood prone area and has suffered repeated losses.		
Action or Project Intended for Implementation			
Description of the Solution:	The city will conduct a feasibility assessment to determine the best mitigation action (floodproof, elevate, relocate) to protect the range and implement the identified action.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	1-percent storm plus one foot	Estimated Benefits (losses avoided):	Future damages to facility avoided
Useful Life:	50 years	Goals Met:	2
Estimated Cost:	TBD by feasibility assessment	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 5 years	Potential Funding Sources:	Municipal budget, PDM, HMGP
Responsible Organization:	FPA, Police 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
	Close pistol range	N/A	Pistol range needs to remain open
	Purchase deployable floodwall	\$15,000	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:	Feasibility assessment for police pistol range	
Project Number:	2020-East Orange-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Protects pistol range from flood range
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	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	3 years
Agency Champion	1	FPA, Police Department
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL properties		
Project Number:	2020-East Orange-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the <u>low lying areas below bridges effectively separating the city</u> in addition to Soverel Park which is traversed by the <u>Second River</u> . This area is residential, and these areas have been repetitively flooded as documented by paid NFIP claims.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 15 flood-prone property owners, including RL 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 along the Second River that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard (<i>in accordance with flood ordinance</i>)	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:	2
Estimated Cost:	\$1.5 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 properties	
Project Number:	2020-East Orange-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 protect or remove families from areas of impact along the Second River
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:	Obtain sources of backup power for critical facilities to ensure continuity of operations		
Project Number:	2020-East Orange-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Failure		
Description of the Problem:	The following critical facilities are currently identified as lacking backup power sources: 1. East Orange Fire Station 2 2. East Orange Fire Station 3 3. East Orange Fire Station 5 4. East Orange City garage Critical facilities need to maintain power in order to ensure continuity of critical services.		
Action or Project Intended for Implementation			
Description of the Solution:	The city will obtain generators and necessary electrical components for the following critical facilities to ensure continuity of operations.: 1. East Orange Fire Station 2 generator 2. East Orange Fire Station 3 generator 3. East Orange Fire Station 5 generator 4. East Orange City garage generator		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Power losses prevented	Estimated Benefits (losses avoided):	Critical services maintained.
Useful Life:	15 years	Goals Met:	6
Estimated Cost:	\$120,000	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:	HMGP, municipal budget
Responsible Organization:	East Orange OEM	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
	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:	Obtain sources of backup power for critical facilities to ensure continuity of operations	
Project Number:	2020-East Orange-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 from power loss.
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	0	Utility failure
Timeline	0	Within 5 years
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Reconstruction of Second River channel walls		
Project Number:	2020-East Orange-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Second River channel walls are degraded. The design phase is already funded for replacement channel structure.		
Action or Project Intended for Implementation			
Description of the Solution:	The city will complete reconstruction of the Second River channel walls.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Channel walls protected from failure	Estimated Benefits (losses avoided):	Channel wall failure and increased flooding risk reduced.
Useful Life:	50 years	Goals Met:	1, 2
Estimated Cost:	\$1.5 million	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:	5 years	Potential Funding Sources:	HMGP, FMA
Responsible Organization:	Department of 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
	Buyout properties in area likely to be flooded by failure of channel walls	\$2 million	Property owners unlikely to be interested in buyout.
	Remove channel walls to natural wetlands.	\$500,000	Wetlands unlikely to be able to handle capacity of channel.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Reconstruction of Second River channel walls	
Project Number:	2020-East Orange-007	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Project will protect channel walls from collapse
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	Department of Public Works
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	Within 5 years
Agency Champion	1	
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	



BOROUGH OF ESSEX FELLS

MUNICIPALITY AT A GLANCE

Total Population: **2,095**
 Total Land Area: **1.4 sq mi**
 Total # Buildings: **766**



1% Annual Chance Flood



0

Population Residing
in Floodplain



0

Persons That
May Seek Shelter



\$0

Potential
Building Damages



0

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$265 Thousand

Potential Building Damages

NFIP Statistics



9 # NFIP
Policies

0 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection,
Public Education/Awareness,
Emergency Services, Structural
Projects

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9.7 BOROUGH OF ESSEX FELLS

This section presents the jurisdictional annex for the Borough of Essex Fells. The annex includes a general overview of the Borough of Essex Fells; an assessment of the Borough’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 hazards.

9.7.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Essex Fells; 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
Name / Title: James Egan, E.M. Coordinator Address: 255 Roseland Avenue Essex Fells, NJ 07021 Phone Number: 973-518-3011 Email: jimegan103@gmail.com	Name / Title: Sgt. John R. Schmunk, Deputy EM Coordinator Address: 255 Roseland Avenue Essex Fells, NJ 07021 Phone Number: 201-615-2397 Email: jschmunk@essexfellsd.org
NFIP Floodplain Administrator	
Name / Title: Neglia Engineering Address: 34 Park Avenue Lyndhurst, NJ 07071 Phone Number: 201-939-8805 Email: nea@negliaengineering.com	

9.7.2 Jurisdiction Profile

The name Essex Fells was derived from the name of the County in which it resides and one of the founders of the Suburban Land Company, John F. Fell), who helped create the new residential community. An ordinance passed in 1928 limited commercial activity to single three-story buildings that are constructed to look like a house (The Borough of Essex Fells, New Jersey, 2014).

The Borough of Essex Fells operates under the borough form of government which consists of a Mayor and six-member Council. The Council is elected at-large every three years on a staggering basis with two seats coming up for election every year. The Mayor is elected every four years (The Borough of Essex Fells, New Jersey, 2014). According to the U.S. Census Bureau, the Borough has a total land area of 1.418 square miles, of which 1.412 square miles is land and 0.006 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Essex Fells was 2,113. The estimated 2017 population was 2,095, a 0.9 percent decrease from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.9 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.

9.7.3 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 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

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	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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
None completed					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None identified					

* Only location-specific hazard zones or vulnerabilities identified.

9.7.4 Capability Assessment

The Borough of Essex Fells 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.

Areas that mitigation is currently integrated are summarized in this subsection. The Borough of Essex Fells 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 Essex Fells.

Table 9.7-3. 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 and State	Yes	No	No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Borough of Essex Fells Building Code, Chapter 103 pg 103:1; Adopted 12/21/1976</i>					
Zoning Code	Yes	Local and State	Yes	No	No
<i>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 170 Land Development, Part 3 Zoning. Administered by the Planning Board and Zoning Board of Adjustment.</i>					
Subdivisions	Yes	Local and State	Yes	No	No
<i>Comment: 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. Borough of Essex Fells Subdivision Ordinance, Chapter 170 pg 170:48; Adopted 6/15/2014. Administered by the Planning Board and Zoning Board of Adjustment.</i>					
Stormwater Management	Yes	Local	Yes	No	No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Borough of Essex Fells Stormwater Management Ordinance, Chapter 241 pg 241:1; Adopted 6/7/2005</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	No
<i>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.</i>					
Growth Management	Yes	Local, State	Yes	No	No
<i>Comment: State mandated at local level. Adopted 4/16/1996, 170:50</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	No
<i>Comment: Chapter 170 Land Development, planning board</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					



	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	No	No	2020-Essex Fells-007
<i>Comment: Adopted 12/18/1979, Updated 6/5/2007, Chapter 141</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: Master Plan 2018: Borough of Essex Fells New Jersey. Issues affecting community: Dying and old trees being lost on public and private lands. Has a goal to replace sugar maple and dogwood trees on public lands and encourage new plantings on private lands. Master plan notes extensive tree damage and power outage from significant weather events. Trees are 80 to 130 years old. Oak Lane, Wootton Road, Fells Road, Oldchester Road, and Beechtree Lane. Goal to establish procedures to regularly address environmental issues.</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes	No
<i>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. Borough does not have a formal strategic plan, but capital budget is revised annually to account for present need.</i>					
Disaster Debris Management Plan	Yes	Local	No	No	No
<i>Comment: DPW service building - Borough trucks/outside contractors dump into a pile and grind to make mulch - DEP certified</i>					
Floodplain or Watershed Plan	No	-	No	-	-
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes	No
<i>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). Administered by Neglia Engineering.</i>					
Stormwater Pollution Prevention Plan	No	Local and State	Yes	-	-
<i>Comment:</i>					



	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 #.
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	No	-	No	-	-
<i>Comment:</i>					
Shoreline Management Plan	No	-	No	-	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	-	-
<i>Comment:</i>					
Transportation Plan	No	-	No	-	-
<i>Comment:</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	No	-	No	-	-
<i>Comment:</i>					
Other	Yes	Local	No	No	2020-Essex Fells-005
<i>Comment: Essex Fells Asset Management Plan documents issues with assets and actions that need to be implemented.</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	No
<i>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. EOP Adopted 2018</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	-	-	-	-
<i>Comment:</i>					



	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	-	-	-	-
<i>Comment:</i>					
Public Health Plan	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					

Table 9.7-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes, Planning Board
- If no, who does? If yes, which 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; The Borough has no capacity for substantial new development.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Essex Fells.

Table 9.7-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	Yes	Mitigation Planning Committee
Environmental Board / Commission	Yes	Environmental Commission
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, General social media
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Varied
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering



Staff/Personnel Resource	Available?	Department/Agency/Position
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	No	-
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyors	No	Outsourced as needed
Stormwater engineer	Yes	Neglia Engineering
Personnel skilled or trained in GIS applications	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management; Department Heads
Grant writers	Yes	Engineering; Department Heads
Resilience Officer	No	-
Watershed planner	Yes	Engineering
Environmental specialist	Yes	Engineering
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Essex Fells.

Table 9.7-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Borough generally does not meet grant qualifications
Capital Improvements Project Funding	Yes – Finance
Authority to Levy Taxes for Specific Purposes	Yes – Mayor and Council
User Fees for Water, Sewer, Gas or Electric Service	Yes – Mayor and Council; Water and Sewer
Incur Debt through General Obligation Bonds	Yes – Mayor and Council
Incur Debt through Special Tax Bonds	Yes – Mayor and Council
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 Essex Fells.

Table 9.7-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes – Chief of Police
Do you have personnel skilled or trained in website development?	No





Criterion	Response
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – Reverse 911, Nixle, General social media
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> If yes, briefly describe. 	Nixle, CodeRed

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Essex Fells.

Table 9.7-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
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.

Table 9.7-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	Low
Drought	Low
Earthquake	Low
Extreme Temperature	Medium
Flood (<i>riverine / flash flood, SLR</i>)	Low
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	High
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Medium
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Medium
Hazardous Substances	Low
Utility Interruption	High
Terrorism	High
Transportation Failure	Low

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 9.7-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Neglia Engineering
Are any certified floodplain managers on staff in your jurisdiction?	Yes/No
What is the date that your flood damage prevention ordinance was last amended?	6/5/2007
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	None
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No; Was included in the 2018 Hackensack-Passaic Watershed, 02030103 Flood Risk Report
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
<input type="checkbox"/> If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> 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?*	Flood insurance policies: 9 Insurance in force: \$2,842,000



Criterion	Response
<ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Premium in force: \$3,468
How many total loss claims have been filed in your jurisdiction? <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Total loss claims: 12 Claims still open or closed without payment: 2 Total payments for losses: \$100,750
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 March 31, 2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

Building and Zoning Department: The Building Department serves to assist Essex Fells residents and commercial contractors wishing to initiate construction within the Borough. The responsibilities of this office include compliance with all State rules and regulations regarding construction including code enforcement for the following: UCC of New Jersey, IBC of New Jersey, IRC of New Jersey, IFC International, Fire Code NSP, National Standard Plumbing Code and the NEC National Electric Code.

West Orange Health Department: The Borough of Essex Fells shares a Health Department with West Orange. Staff is available for response at all times through central dispatch at the Police Department. The Health Department participates as a member of the Emergency Management Team and develops and updates the annexes that the department is responsible for. All divisions are utilized when indicated for natural disasters or biological/chemical events.

Public Works Department: The Public Works Department is responsible for building maintenance and repairs, snow plowing and street sweeping.

Essex Fells Water Department: The Essex Fells Water Department has 16 wells, with 3 water storage tanks, totaling 2.8 million gallons, various interconnections, booster pumping stations, and transmission and distribution facilities a treatment facility and a main pumping station. We supply drinking water not only the customers of Essex Fells, but supply the towns of Roseland, Caldwell, North Caldwell, and the Hilltop portion of Verona with drinking water. The Water Department is a 7 day a week operation with three full time employees sharing rotating shifts to maintain and operate its facilities. The Water Department every year undergoes various Capital Projects to upgrade and improve the Water system, from replacing residential meters, to replacing water mains, and wells. Duties include:

- Maintaining and repairs of well pumps
- Maintaining and repairs of water storage facilities
- Maintaining and repairs to water mains
- Maintaining and repairs to fire hydrants
- Maintaining and repair of residential water meters
- Reading of residential water meters for billing
- Water sampling in accordance with NJDEP standards

Municipal website: The Borough of Essex Fells municipal website (<http://www.essexfellsboro.com/>) includes information on stormwater and flooding.



Sustainable Essex Alliance: The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

9.7.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Borough of Essex Fells’ history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.7-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019; refer to Appendix E for a complete list of disaster declarations. Information provided in the table below is based on reference material or local sources.

Table 9.7-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
March 7, 2018	Winter Storm	N/A	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. Trained spotters and the public reported 1 to 2 feet of snow. 23.0 inches was reported in North Caldwell and 19.7 inches in Roseland. The heavy wet snow and strong winds also brought down trees and some power lines.	\$140,000 from State; Power outages, debris removal, overtime.
September 25, 2018	Flash Flooding	N/A	Rainfall amounts generally ranged from 3-5 inches, with one CoCoRaHS observer reporting 5.56 inches of rain in Palisades Park.	Flooding Forest Way, Devon Road



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 9.7-12 summarizes the Borough of Essex Fells risk assessment results and data used to determine the hazard ranking. The following summarizes the hazards of greatest concern and risk to the Borough of Essex Fells.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 9.7-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$264,906	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$1,488,965	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	176	NEHRP D&E:	64	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$395,156	
						2,500-year Loss:	\$6,762,432	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	378	Physical 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.		Low
		Population Below Poverty Level:	21					
Flood	100- and 500-Year Mean Return Period Event	100-year	0	100-year	0	100-year Loss:	\$0	High
		500-year	5	500-year	2			
Geological	High Landslide Susceptibility Areas	Class A:	8	Class A:	3	Class A:	\$1,745,705	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	3	Wildfire:	1	Wildfire:	\$102,270	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Power Outage	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2





REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Essex Fells.

- 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

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 AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.7-13. Potential Flood Losses to Critical Facilities and Lifelines

Table with 5 columns: Name, Type, Exposure (1% Event, 0.2% Event), Status of Mitigation. Row 1: Well 6 (Essex Fells), Potable Well, -, X, -

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Essex Fells provides water to five communities and the water infrastructure is considered critical as an attack or interruption would cause water shortages to five communities.
Power lines Borough-wide are all above ground and vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.
Widespread power outages and road closures occur during hazard events.
Forest Way experiences flooding.
Devon Road Flooding; area was originally a marsh.
High Service/Low Service tanks have emergency response communications antenna on top. If these facilities lose power, emergency communications cannot function.
The Essex Fells Asset Management Plan details issues with the Fells Road Pump. The pump is out of service and prone to leaks due to the line being active. The chamber is also not heated and vulnerable to freezing of the line that can cause service interruption.
The Essex Fells Asset Management Plan details issues with the Fells Road /Rensselaer Crossover. The chamber is not heated and vulnerable to freezing of the line that can cause service interruption.



HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Essex Fells 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 Essex Fells has significant exposure; Figures 9.7-1 and 9.7-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The table below summarizes the hazard risk/vulnerability rankings of potential hazards for the Borough of Essex Fells. The Borough of Essex Fells has reviewed the Essex 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 drought from medium to low.
- The Borough changed the hazard ranking for wildfire from low to medium.
- The Borough changed the hazard ranking for terrorism from low to high

Table 9.7-14. Borough of Essex Fells Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Low	Low	Medium	Low

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	High	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 9.7-15. 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 #
Essex Fells-1: Obtain backup power for critical facilities to ensure continuity of operations. The following has been identified as project locations at this time: 1. Essex Fells Police and Borough Hall generator 2. Essex Department of Public Works Generator 3. Essex Fells First Aid Squad generator	Borough OEM	In progress	X	2020-Essex Fells-001
Essex Fells-2: Upgrade security system for water utility	Borough OEM, Water Utility	In progress	X	2020-Essex Fells-002
Essex Fells-3: Auxiliary power for water utility to mitigate loss of potable water during power outages	Borough OEM, Water Utility	In progress	X	2020-Essex Fells-003
Essex Fells-4: Complete a flood study of the Pine Brook	Borough Engineer, FPA	Completed		
Essex Fells-5: Prioritize flood hazard mitigation alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation depending on feasibility. The parameters for feasibility for this initiative would be: funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available. Specifically identified are properties in the following areas: <ul style="list-style-type: none"> • Oval Road • Roseland Avenue • Holly Lane 	Borough Engineer, FPA	Ongoing capability		
Essex Fells-6: 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	Borough Supervisor's Office	In progress	X	2020-Essex Fells-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 #
insurance. This program will include brochures, flyers, website: <ul style="list-style-type: none"> • 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 Town/Village hall or distributing at regular civic meetings. <ul style="list-style-type: none"> • 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 in the annual newsletter. 				

The Borough did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Essex Fells participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Essex Fells was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.7-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Essex Fells 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.7-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.7-18 summarizes the actions by type across hazards of concern.



Table 9.7-16. 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-Essex Fells-001	Obtain backup power for critical facilities	Critical facilities require backup power in order to maintain continuity of operations.	The Borough will work to obtain and install generators for the following: 1. Essex Fells Police and Borough Hall 2. Essex Department of Public Works 3. Essex Fells First Aid Squad 4. High Service/Low Service tanks.	Existing	Utility Interruption	6	<u>Borough OEM</u>	HMGP, PDM, municipal budget	Continuity of operations maintained at critical facilities	\$25,000 per generator	Within 5 years	High	SIP	PP, ES
2020-Essex Fells-002	Upgrade security system for water utility	Attack or interruption would cause water shortages to five communities.	The Borough will install 25 replacement doors for 16 water utility facilities	Existing	Utility Interruption, Terrorism	1, 2, 5	<u>Borough OEM, Water Utility</u>	Municipal budget, HMGP, PDM	Increase security to prevent loss of water utility.	\$75,000	Within 5 years	High	SIP	PP
2020-Essex Fells-003	Auxiliary power for water utility	Power loss results in water shortages to five communities.	Purchase and install a backup generator and necessary electrical components	Existing	Utility Interruption	6	<u>Borough OEM, Water Utility</u>	HMGP, PDM	Continuity of operations	\$25,000 per generator	Within 5 years	High	SIP	PP, ES
2020-Essex Fells-004	Work with utility companies to trim problem trees	Power lines Boroughwide are all above ground and	The Borough will keep records of public	Existing	Utility Interruption, Severe Storm,	2	<u>Borough OEM, PSE&G</u>	Municipal budget	Reduction in utility interruption	Staff time	Within 6 months.	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
		vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.	concerns for tree locations that would be likely to have falling branches near utility lines. The Borough will relay this information to utility companies who will address the problem.		Severe Winter Storm									
2020-Essex Fells-004	Increase all-hazards education and outreach	Problem: The public needs to have knowledge on hazards to make appropriate safety and preparedness decisions.	Solution: 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 brochures,	N/A	All hazards	3, 4	<u>Borough Supervisor's Office</u>	Municipal budget	Educated public	Staff time, \$1,000	Within 3 years	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	
			<p>flyers, website:</p> <ul style="list-style-type: none"> •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 												
2020-Essex Fells-005	Upgrade Fells Road Pump and Fells	The Essex Fells Asset Management Plan details	The Borough will repair the pump and	Existing	Utility Interruption, Extreme Temperature	1, 2, 6	Public Works	Municipal budget	Service interruption reduced.	\$75,000	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
	Road/Rensselaer Crossover	issues with the Fells Road Pump and the Fells Road/Rensselaer Crossover. The pump is out of service and prone to leaks. The Crossover chamber is not heated and vulnerable to freezing of the line that can cause service interruption.	investigate what options exist to prevent the chamber from freezing and implement the desired action.											
2020- Essex Fells-006	Mitigate flooding at Devon Road and Forest Way.	Devon Road and Forest Way are prone to flooding.	The Borough will conduct a drainage study of Devon Road and Forest Way to determine the causes of flooding and possible actions to reduce flooding. The Borough will then implement the desired actions.	Existing	Flood, Severe Storm	1, 2	Engineering	Municipal budget, HMGP, BRIC	Reduction in flooding on Devon Road and Forest Way	To be determined by drainage study	Within 5 years	Medium	LPR, SIP	SP
2020- Essex Fells-007	Update Flood Damage Prevention Ordinance to include freeboard	The current FDPO does not include the state's freeboard requirement.	The Borough will update the FDPO to include the state mandated	New	Flood	2	FPA	Municipal budget	Meet state standards, reduce future flood risk	\$100	Within 6 months	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
			freeboard requirement.											

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 9.7-17. 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-Essex Fells-001	Obtain backup power for critical facilities	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High
2020-Essex Fells-002	Upgrade security system for water utility	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Essex Fells-003	Auxiliary power for water utility	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High
2020-Essex Fells-004	Increase all-hazards education and outreach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Essex Fells-004	Work with utility companies to trim problem trees	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Essex Fells-005	Upgrade Fells Road Pump and Fells Road/Rensselaer Crossover	1	1	0	1	1	1	0	1	1	1	1	0	1	1	11	High
2020-Essex Fells-006	Mitigate flooding at Devon Road and Forest Way.	0	1	0	1	1	1	0	1	0	0	1	0	1	1	8	Medium
2020-Essex Fells-007	Update Flood Damage Prevention Ordinance to include freeboard	0	1	1	1	1	1	1	1	1	1	0	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 9.7-18. 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 Erosion and Sea Level Rise			2020-Essex Fells-004					
Coastal Storm			2020-Essex Fells-004					
Drought			2020-Essex Fells-004					
Earthquake			2020-Essex Fells-004					
Extreme Temperature		2020-Essex Fells-005	2020-Essex Fells-004					
Flood	2020-Essex Fells-007		2020-Essex Fells-004			2020-Essex Fells-006		
Geological Hazards			2020-Essex Fells-004					
Severe Weather	2020-Essex Fells-004		2020-Essex Fells-004					
Winter Storm	2020-Essex Fells-004		2020-Essex Fells-004					
Wildfire			2020-Essex Fells-004					
Civil Disorder			2020-Essex Fells-004					
Cyber Attack			2020-Essex Fells-004					
Disease Outbreak			2020-Essex Fells-004					
Economic Collapse			2020-Essex Fells-004					
Hazardous Substances			2020-Essex Fells-004					
Utility Interruption	2020-Essex Fells-004	2020-Essex Fells-001, 2020-Essex Fells-002, 2020-Essex Fells-003, 2020-Essex Fells-005	2020-Essex Fells-004			2020-Essex Fells-001, 2020-Essex Fells-003		
Terrorism			2020-Essex Fells-004					
Transportation Failure			2020-Essex Fells-004					

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.7.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Essex Fells 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-



off sheets in Appendix B (Participation Documentation). 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 9.7-19. Contributors to the Annex

Entity	Title	Method of Participation
Jim Egan	Director of OEM	Primary POC, provided impact data, reviewed draft and provided comments.
Sgt. John R. Schmunk, Deputy EM Coordinator	Sgt. John R. Schmunk, Deputy EM Coordinator	Secondary POC, Reviewed draft and provided comments.



Figure 9.7-1. Borough of Essex Fells Hazard Area Extent and Location Map

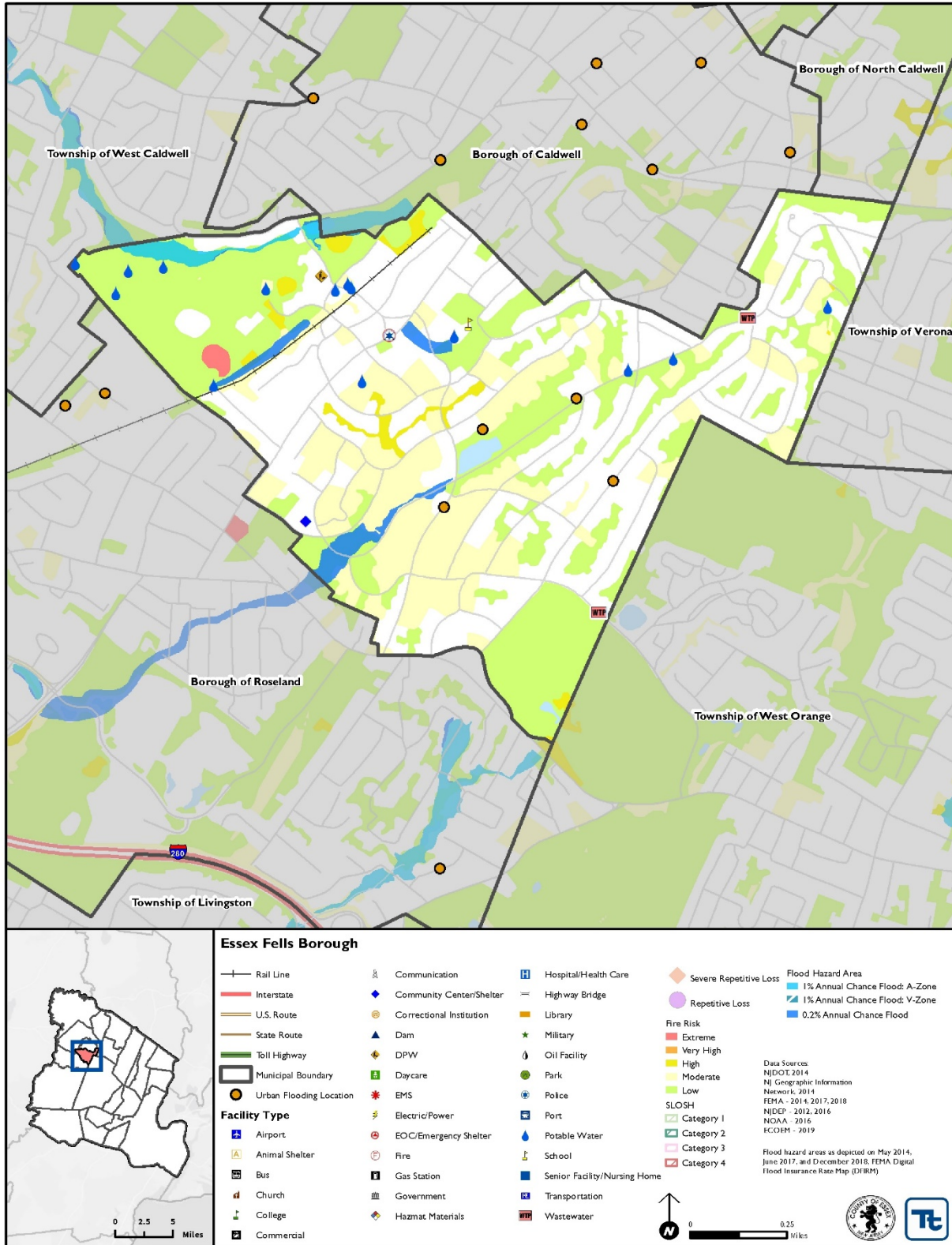
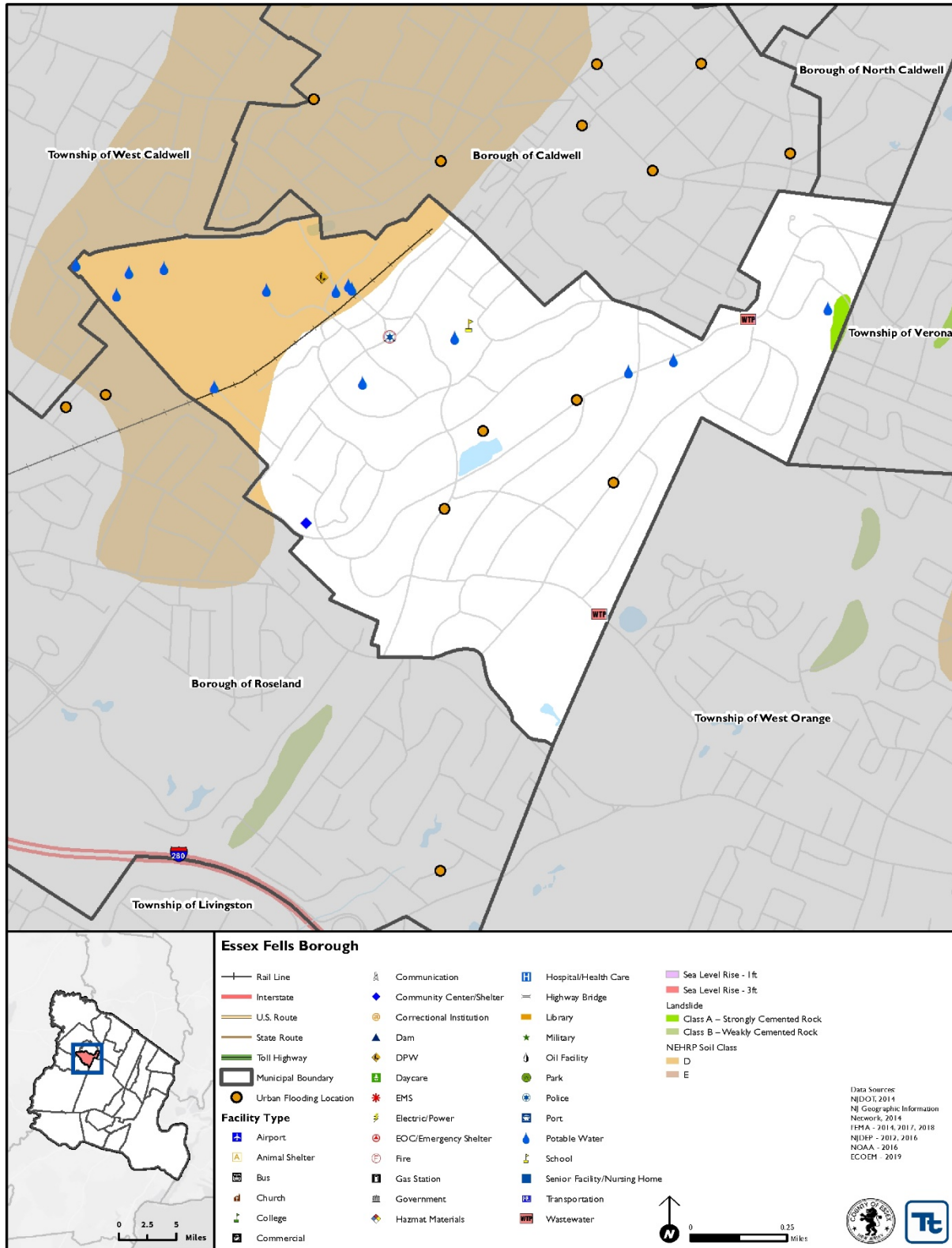




Figure 9.7-2. Borough of Essex Fells Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Obtain backup power for critical facilities		
Project Number:	2020-Essex Fells-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	Critical facilities require backup power in order to maintain continuity of operations. The following facilities lack backup power: 1. Essex Fells Police and Borough Hall 2. Essex Department of Public Works 3. Essex Fells First Aid Squad 4. High Service/Low Service tanks.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work to obtain and install generators, in addition to necessary electrical components at the identified facilities.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Ensures continuity of operations; provides a shelter for residents
Useful Life:	20 years	Goals Met:	6
Estimated Cost:	\$25,000 per generator	Mitigation Action Type:	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	HMGP, PDM, municipal budget
Responsible Organization:	Borough 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
	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:	Obtain backup power for critical facilities	
Project Number:	2020-Essex Fells-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will protect critical services of critical facilities.
Property Protection	1	Project will protect critical facilities from power loss.
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	Utility replace
Timeline	0	Within 5 years
Agency Champion	1	Borough OEM
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Upgrade security system for water utility		
Project Number:	2020-Essex Fells-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption, Terrorism		
Description of the Problem:	A terrorist attack or other interruption would cause water shortages to the five communities serviced by the water utility.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will purchase and install 25 replacement doors for 16 water utility facilities. These facilities, the number of doors, and their cost are listed below:		
	Facility	Number of Doors	Cost
	Well 2 EFCC	2 Doors	\$6,000.00
	Well 4A West Caldwell Gray St	4 Doors	\$12,000.00
	Well 5 102 Hathaway Ln	1 Door	\$3,000.00
	Well 6 Inwood Rd	1 Door	\$3,000.00
	Well 7 Essex Fells Trotter Tract	1 Door	\$3,000.00
	Well 8 Essex Fells Trotter Tract	1 Door	\$3,000.00
	Well 9 Essex Fells Trotter Tract	1 Door	\$3,000.00
	Well 10 Eisenhower PKWY Roseland	1 Door	\$3,000.00
	Well 11 Eagle Rock Ave Roseland	2 Doors	\$6,000.00
	Well 12 Eisenhower PKWY Roseland	2 Doors	\$6,000.00
	Well 13 Dodd Rd West Caldwell	1 Door	\$3,000.00
	Well 14 Essex Fells Trotter Tract	1 Door	\$3,000.00
	Well 15 Pitcairn Dr Roseland	1 Door	\$3,000.00
	Well 16 Pitcairn Dr Roseland	1 Door	\$3,000.00
	Well 17 Harrison Ave Roseland	1 Door	\$3,000.00
# 1 Pump House 318 Runnymede Rd Essex Fells	4 Doors	\$12,000.00	
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	



Level of Protection:	Security of facilities improved.	Estimated Benefits (losses avoided):	Increase security to prevent loss of water utility.
Useful Life:	25 years	Goals Met:	1, 2, 5
Estimated Cost:	\$75,000	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 :	2 years	Potential Funding Sources:	Municipal budget, HMGP, PDM
Responsible Organization:	Borough OEM, Water Utility	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
	Replace locks on doors	\$25 per lock	Easily cut, doors still weak.
	Install fencing	\$12 per linear foot	Fence can be easily cut or climbed.
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 security system for water utility	
Project Number:	2020-Essex Fells-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project protects water utility's critical service
Property Protection	1	Project protects critical facilities
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	Borough has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Terrorism, Utility Replace
Timeline	0	Within 5 years
Agency Champion	1	Borough OEM, Water Utility
Other Community Objectives	1	Protects service to neighboring facilities
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Auxiliary power for water utility		
Project Number:	2020-Essex Fells-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	Power loss at water utility facilities results in water shortages to five communities that are serviced by the water utility.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will identify water utility facilities that require backup power. The Borough will work to obtain and install generators at those facilities, in addition to necessary electrical components at the identified facilities.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Ensures continuity of operations; provides a shelter for residents
Useful Life:	20 years	Goals Met:	6
Estimated Cost:	\$25,000 per generator	Mitigation Action Type:	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	HMGP, PDM, municipal budget
Responsible Organization:	Borough OEM, Water Utility	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	\$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:	Auxiliary power for water utility	
Project Number:	2020-Essex Fells-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will protect critical services of water utility.
Property Protection	1	Project will protect water utility facilities from power loss.
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	Utility replace
Timeline	0	Within 5 years
Agency Champion	1	Borough OEM
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flooding at Devon Road and Forest Way.		
Project Number:	2020-Essex Fells-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Devon Road and Forest Way are prone to flooding. Devon Road is currently undergoing reconstruction which may change flooding, but the likely results are currently unknown.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a drainage study to determine the cause of flooding. Implement drainage solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by drainage study	Goals Met:	1, 2
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	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:	Mitigate flooding at Devon Road and Forest Way.		
Project Number:	2020-Essex Fells-006		
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	1	
Social	0	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



TOWNSHIP OF FAIRFIELD

MUNICIPALITY AT A GLANCE

Total Population: **7,671**
 Total Land Area: **10.3 sq mi**
 Total # Buildings: **3,121**



1% Annual Chance Flood



4,346

Population Residing
in Floodplain



220

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$1.7 Million

Potential Building Damages



\$543 Million

Potential
Building Damages



15

Critical Facilities
in Floodplain

NFIP Statistics



1,016 # NFIP
Policies

217 # SRL NFIP
Properties

55 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Property Protection, Public
Education/Awareness, Emergency
Services, Structural Projects

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9.8 TOWNSHIP OF FAIRFIELD

This section presents the jurisdictional annex for the Township of Fairfield. The annex includes a general overview of the Township of Fairfield; an assessment of the Township’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 Township of Fairfield’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: William Smith, OEM Coordinator Address: 230 Fairfield Road Fairfield, NJ 07004 Phone Number: 973-445-1550 Email: wsmith@fairfieldnj.org	Name / Title: Steve Bury, Engineer Address: 230 Fairfield Road Fairfield, NJ 07004 Phone Number: 973-882-2700 ext. 2504 Email: sbury@fairfieldnj.org
NFIP Floodplain Administrator	
Name / Title: Phil Cheff, Construction Official Address: 230 Fairfield Road Fairfield, NJ 07004 Phone Number: 973-882-2700 ext. 2503 Email: pcheff@fairfield.org	

9.8.2 Jurisdiction Profile

In 1669, the Dutch settled along the Passaic River in the area now known as Fairfield Township. The land was purchased from Native Americans and named Gansegat, which is Dutch for “duck’s pond” (Township of Fairfield, 2014).

Fairfield Township has operated as a Small Municipality Plan C form of government since 1962 (Township of Fairfield, 2014). According to the U.S. Census Bureau, the Township has a total land area of 10.46 square miles, of which 10.296 square miles is land and 0.164 square miles is water.

According to the U.S. Census, the 2010 population for the Township of Fairfield was 7,466. The estimated 2017 population was 7,671, a 2.7 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 21.5 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, where available.

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	10	1	10	9	22
Multi-Family	4	2	0	1	0
Other (commercial, mixed-use, etc.)	0	2	1	0	2
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Recreation Center	Recreation	1	Hollywood Ave	X zone	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
DMR60	Apartment	32	Magnolia Lane	X zone	90% Complete
74 Passaic Ave	Apartment	36	74 Passaic Ave	X zone	Approved/unknown start date
Stonybrook	Townhome	25	Stonybrook	X zone	Under Construction
161 Fairfield	Townhome	24	161 Fairfield	X zone	Under Construction
170 Fairfield	Townhome	24	170 Fairfield	X zone	Board Approval Applied For
Carlos Drive	Unknown	99	Carlos Drive	X zone	Board Approval Applied For
202 Fairfield	Apartment	29	202 Fairfield	X zone	Approved/unknown start date
Allaire Health Care, LLC	Assisted Living	80 beds	212 Passaic Ave	X zone and A zone	Approved/unknown start date

* Only location-specific hazard zones or vulnerabilities identified.

9.8.4 Capability Assessment

The Township of Fairfield 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.

Areas that mitigation is currently integrated are summarized in in this section. The Township of Fairfield 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 Fairfield.

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	Local and State	Yes	No	-
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Chapter 10 Building and Housing of the municipal code, enforced by the Building Department.</i>					
Zoning Code	Yes	Local and State	Yes	No	-
<i>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 45 Zoning of the municipal code. Enforced by Zoning Officer.</i>					
Subdivisions	Yes	Local and State	Yes	No	-
<i>Comment: 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 42 Land Subdivision of the municipal code. Adopted 1969.</i>					
Stormwater Management	Yes	Local	Yes	No	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 21 Streams, Water Courses, Catch Basins, Street Stormwater Sewer Inlet and Drainage Ditches. Adopted 2004. Chapter</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
<i>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.</i>					
Growth Management	Yes	Local	Yes	No	-
<i>Comment: State mandated at local level. Chapter 42 Land Subdivision of the municipal code. Adopted 1969. Also noted as a goal in the master plan.</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore</i>					



	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 #.
<i>protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	-
<i>Comment: Chapter 42 Land Subdivision of the municipal code. Adopted 1969.</i>					
Environmental Protection	Yes	Local	Yes		
<i>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 21 Streams, Water Courses, Catch Basins, Street Stormwater Sewer Inlet and Drainage Ditches. Adopted 2004. Chapter 44 Environmental Impact Statement. Adopted 2011. Administered by Township Engineer.</i>					
Flood Damage Prevention	Yes	Local	No	No	-
<i>Comment: Chapter 45 Zoning, Article 8 Flood Damage Prevention of the municipal code. Adopted 2007. Administered by floodplain administrator (construction official).</i>					
Wellhead Protection	No				
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
<i>Comment: Master Plan Reexaminations in 2005 and March 2012. The reexamination reports both had goals of ensuring that traffic circulation and safety issues are affirmatively addressed on a local and regional scale. The reexamination also highlights flood risk in the Passaic River Basin as a major concern and suggests larger lots/impervious surface limits and creating a flood overly district as possible methods to minimize flood risk. The plan notes potential methods of impervious area management. The plan suggests the creation of a flood hazard mitigation plan. The plan suggests the township consider implementation of a Low Impact Development Ordinance.</i>					
Capital Improvement Plan	Yes	Local	Allowed	No	-
<i>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.</i>					
Disaster Debris Management Plan	No	-	No	-	-
<i>Comment:</i>					
Floodplain or Watershed Plan	Yes	Local	No	No	No
<i>Comment: Floodplain Management Plan</i>					
Stormwater Management Plan	Yes	Local and State	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 #.
<p><i>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 of Fairfield Stormwater Management Plan. March 8, 2005. The plan outlines specific stormwater design and performance standards for new development and proposes management controls to address impacts from existing development. Resulted in amendments to the zoning ordinance to incorporate nonstructural stormwater management strategies.</i></p>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	No	-
<p><i>Comment: Township of Fairfield Essex County, New Jersey Stormwater Pollution Prevention Plan. March 9, 2005, Rev. October 15, 2007.</i></p>					
Urban Water Management Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Habitat Conservation Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Economic Development Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Shoreline Management Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Community Wildfire Protection Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Community Forest Management Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Transportation Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Agriculture Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Climate Action Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Tourism Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Business Development Plan	No	-	No	-	-
<p><i>Comment:</i></p>					
Other	No	-	No	-	-
<p><i>Comment:</i></p>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) /	Yes	Local	Yes	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 #.
Emergency Operations Plan (EOP)					
<i>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.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	No	Yes	No
<i>Comment: Local Fire Prevention has software to keep track of Hazard Identification risk.</i>					
Post-Disaster Recovery Plan	Yes	Local	No	No	No
<i>Comment:</i>					
Continuity of Operations Plan	Yes	Local	No	No	No
<i>Comment:</i>					
Public Health Plan	Yes	Local	No	No	No
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					

Table 9.8-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes, Engineering Department
- If no, who does? If yes, which 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

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Fairfield.

Table 9.8-5. 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	Yes	Recreation Commission





Staff/Personnel Resource	Available?	Department/Agency/Position
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	North Caldwell Fire; Pine Brook Fire; North Caldwell Police; West Essex First Aid
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	No	None
Staff with training in green infrastructure	No	None
Staff with education/knowledge/training in low impact development	No	None
Surveyors	No	-
Stormwater engineer	Yes	Township Engineer
Personnel skilled or trained in GIS applications	Yes	Engineering
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management - OEM Coordinator
Grant writers	Yes	Engineering; Fire
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Fairfield.

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	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes, local Sewer and Water Ordinance
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



Financial Resource	Accessible or Eligible to Use?
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 Fairfield.

Table 9.8-7. 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?	No
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes; Office of Emergency Management website hosts links to flood gauges and general flooding information, the National Flood Insurance Program, FEMA Map Service Center, and information on how to apply for disaster assistance.
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Town website, 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.	Yes, CRS program
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; Warning methods available to the Township include EBS (WPAT), Local Radio Stations, Shadow Traffic, Suburban Cablevision, and Swiftreach 911.

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Fairfield.

Table 9.8-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	Yes	6	10/15/2019
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	none	12/14/2009



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.

Table 9.8-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	Low
Drought	Medium
Earthquake	Low
Extreme Temperature	Medium
Flood (<i>riverine / flash flood, SLR</i>)	High
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	High
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Medium
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Low
Hazardous Substances	Medium
Utility Interruption	High
Terrorism	Low
Transportation Failure	Low

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 9.8-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Official
Who is your floodplain administrator? (name, department/position)	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?	Adopted 1975
Does your floodplain management program meet or exceed minimum requirements?	Exceeds; Fairfield is Class 6 in CRS and completes all requirements to





Criterion	Response
<ul style="list-style-type: none"> If exceeds, in what ways? 	maintain that level. CRS Class 6; Fairfield collects elevation certificates and reports on all substantial development in the floodplain; Fairfield maintains log of any property owner that comes in for mitigation/flood related inquiries.
When was the most recent Community Assistance Visit or Community Assistance Contact?	December 2017-January 2018
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No; Was included in the 2018 Hackensack-Passaic Watershed, 02030103 Flood Risk Report
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? <ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	No
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> 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. Not interested in improving current classification.
How many flood insurance policies are in force in your jurisdiction? <ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Flood insurance policies in force: 1,016 Insurance in force: \$320,521,700 Premium in force: \$2,204,559
How many total loss claims have been filed in your jurisdiction? <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Total loss claims: 1,948 Claims still open or closed without payment: 256 Total payments for losses: \$64,662,589
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 - currently no homeowners interested. Engineering maintains log on anyone that comes in for mitigation/flood purposes.

*According to FEMA statistics as of 03/31/2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

- Planning Board:** The Fairfield Township Planning Board serves two primary functions:
 - To make a 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 New Jersey State statutes. This includes drafting, hold hearings, and make recommendations to the Township Council on the adoption of Zoning Ordinances
 - The Planning Board hears development applications for permitted uses and makes recommendations regarding the applications to ensure both state law and community standards are met.
- Zoning Board of Adjustment:** The purpose of the Zoning Board of Adjustment is to allow special exceptions to the Zoning Ordinance. These exceptions are allowed where the literal enforcement of the provisions of the Zoning Ordinance does not permit any reasonable use of the property.





- Building Department: The purposes of the Building Department are:
 - To encourage innovation and economy in construction and to provide requirements for construction and construction materials consistent with nationally recognized standards.
 - To permit to the fullest extent feasible to use of modern technical methods, devices and improvements, including premanufactured systems, consistent with reasonable requirements for the health, safety, and welfare of occupants or users of buildings and structures.
 - To eliminate restrictive, obsolete, conflicting and unnecessary construction regulations that tend to unnecessarily increase construction costs or retard the use of new materials, products or methods of construction, or provide preferential treatment to types or classes of materials or products or methods of construction.
- **Emergency Management:** The Fairfield Office of Emergency Management page on the municipal website (<http://www.fairfieldnj.org/OEM-main.html>) hosts information on flood gauges, New Jersey severe storms and flooding, the NFIP, disaster news, and information on how to apply for assistance.
- **Engineering Department:** The Fairfield Engineering Department has several responsibilities including:
 - Planning, design, implementation and inspection of various public works projects, i.e., road improvements, water and sewer improvements and drainage improvements.
 - Flood plain determinators - The department interprets the flood plain hazard maps for residents and other departments, to determine if properties are located within the special flood hazard area.
 - Receives, reviews and processes Planning Board and Board of Adjustment applications.
 - Issue permits for sidewalk repairs, curb repairs, grading permits, driveway expansions, tree removal and road openings
 - The Engineering Department also has various mapping available for review including street maps, flood maps, and topographic maps.
- **Health Department:** The Township of Fairfield contracts with the West Caldwell Health Department for public and environmental health services.
- **Public Works:** Road Division responsibilities include the maintenance of all township roadways, signs, right of ways, recycling, grass and leaf pickup, sanitation, storm drains and snow removal. Sewer and Water Division responsibilities include repairs and maintenance of sanitary sewers and lift stations, water mains and hydrants, service connections, meter reading, water sampling and pool fillings. Fleet Maintenance responsibilities include repair and maintenance of police cars, fire trucks, engineering and administrative vehicles, all Department of Public Works trucks and heavy equipment. Building and Ground Division responsibilities include maintenance of municipal building, Police Headquarters, recreation offices and Firehouses.
- **Zoning Department:** The Fairfield Zoning Department is responsible for enforcing the provisions of Chapter XLV of the Township Code. Listed below are typical functions of the Zoning Office:
 - Discover and ascertain the existence of any zoning violations.
 - Investigate any alleged zoning violation.
 - Prosecute zoning violations in Municipal Court as provided by law.
 - Report to the Board of Adjustment and Planning Board with respect to Matters Before the Board when Required.



- Review building permits for zoning compliance.
- Review inspect and issue required zoning permits for residential and non-residential properties.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.
- **Building Department:** The Township of Fairfield Building Department mission is:
 - To encourage innovation and economy in construction and to provide requirements for construction and construction materials consistent with nationally recognized standards;
 - To permit to the fullest extent feasible to use of modern technical methods, devices and improvements, including premanufactured systems, consistent with reasonable requirements for the health, safety, and welfare of occupants or users of buildings and structures; and
 - To eliminate restrictive, obsolete, conflicting and unnecessary construction regulations that tend to unnecessarily increase construction costs or retard the use of new materials, products or methods of construction, or provide preferential treatment to types or classes of materials or products or methods of construction.

9.8.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Township of Fairfield’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.8-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. 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)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
July 8, 2014	Thunderstorm Wind	N/A	A line of strong with embedded severe thunderstorms formed along a slow-moving cold front as	Multiple trees were reported down around town in Fairfield. \$2K in property damages were reported.



Date(s) of Event	Event Type (disaster declaration if applicable)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
			it progressed through the Northeast.	
July 1, 2016	Thunderstorm Wind	N/A	A passing cold front triggered a few severe thunderstorms over northeast New Jersey.	There were multiple reports of trees and power lines down throughout Fairfield. \$3K in property damages were reported.
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	Snow removal operations and protective measures were taken to reduce the risk to the public.

9.8.6 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 9.8-12 summarizes the Township of Fairfield risk assessment results and data used to determine the hazard ranking. The following summarizes the hazards of greatest concern and risk to the Township of Fairfield.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,746,773	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$9,904,882	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	6,337	NEHRP D&E:	2,578	100-year Loss:	\$0	High
		Liquefaction Class 4:	1,807	Liquefaction Class 4:	735	500-year Loss:	\$14,229,766	
						2,500-year Loss:	\$183,862,678	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,653	Physical 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.		Low
		Population Below Poverty Level:	31					
Flood	100- and 500-Year Mean Return Period Event	100-year	4,346	100-year	1,768	100-year Loss:	\$542,543,680	High
		500-year	6,342	500-year	2,580			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)	Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.	Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.	Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	79	Wildfire:	32	Wildfire: \$35,586,309	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.	Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.	Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.	Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run-down.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County: • Fairfield: 2 • Glen Ridge: 1 (Deleted) • Montclair/ West Orange: 1 (Deleted) • Newark: 4 • Orange: 1 • West Orange/ Orange: 1	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
Power Outage	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low





Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2

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.*



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Fairfield.

- Number of repetitive loss (RL) properties: 217
- Number of severe repetitive loss (SRL) properties: 55
- Number of RL/SRL properties that have been mitigated: 10

Note: The number of SRL properties excludes RL properties.

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).

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines 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	
Essex County Airport	Airport	X	X	2020-Fairfield-008
Fairfield Volunteer Fire Department Station 2	Fire	X	X	2020-Fairfield-009
Medicare Of Fairfield	Health Care	X	X	2020-Fairfield-010
Fairfield Sewer Pump Station	Potable Pump Station	X	X	2020-Fairfield-011
Fairfield Sewer Pump Station	Potable Pump Station	X	X	2020-Fairfield-011
Fairfield Sewer Pump Station	Potable Pump Station	X	X	2020-Fairfield-011
Fairfield Sewer Pump Station	Potable Pump Station	X	X	2020-Fairfield-011
Adlai E. Stevenson Elementary School	School	X	X	2020-Fairfield-012
Banyan School	School	X	X	2020-Fairfield-012
Glenview Academy	School	X	X	2020-Fairfield-012
The Gramon School	School	X	X	2020-Fairfield-012
The Gramon School Fairfield	School	X	X	2020-Fairfield-012
Fairfield Delta Gas Station	Transportation	X	X	2020-Fairfield-013
Ralstons Sunoco Gas Station-Fairfield	Transportation	X	X	2020-Fairfield-013
Valero Gas Station-Fairfield	Transportation	X	X	2020-Fairfield-013

**Identified lifeline*



ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Power lines townshipwide are all above ground and vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.
- Limited manpower and equipment breakdowns cause delays and complications to efficient storm cleanup.
- The following roads experience frequent flood inundation from the Passaic River after prolonged rainfalls along Horseneck Road between the Route 80 underpass and North Jersey Gun Club; Two Bridges Road; Camp Lane.
- Flash flooding during heavy rainfalls occurs along the following roadways:
 - Passaic Ave
 - Dwight Place
 - Washington and Lincoln near the Green Brook
- Airport located in the 1-percent annual chance event floodplain: Essex County Airport
- Medical facility located in the 1-percent annual chance event floodplain: Medicare of Fairfield
- Pump stations located in the 1-percent annual chance event floodplain: Madison Road Sewer Pump Station, Riveredge Drive Sewer Pump Station, Big Piece Road Sewer Pump Station, Ray Place Sewer Pump Station
- Schools located in the 1-percent annual chance event floodplain: Adlai E. Stevenson Elementary School, Banyan School, Glenview Academy, The Gramon School.
- Gas Stations located in the 1-percent annual chance event floodplain: Fairfield Delta Gas Station, Ralstons Sunoco Gas Station, Valero Gas Station.
- There are 217 Repetitive Loss Properties and 55 Severe Repetitive Loss Properties located in the township.
- As of September 2018, there are 1,016 active NFIP policies in the township, while there are 1,768 buildings in the floodplain. Some of these may be due to private insurance holders, but many owners may not have insurance.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Fairfield 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 Fairfield has significant exposure; Figures 9.8-1 and 9.8-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Township of Fairfield. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Fairfield has reviewed the Essex 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 for earthquake from medium to high.
- The Township changed the hazard ranking for wildfire from low to medium.
- The Township changed the hazard ranking for cyber-attack from low to medium.
- The Township changed the hazard ranking for hazardous substances from low to medium.

Table 9.8-14. Township of Fairfield Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Medium	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Medium	High	Low	Low

9.8.7 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 9.8-15. 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 #
Fairfield-1: Acquire thirteen (13) properties - all are SRL or RL identified properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave	Engineering Department	No Progress	X	
Fairfield-2: Fairfield EOC retrofit/hurricane shutters and roof replacement	Engineering Department	No Progress, discontinue. No longer a priority due to municipal complex renovations		
Fairfield-3: Obtain backup power to ensure continuity of operations. Locations identified at this time: 1. Fairfield critical facilities emergency generators 2. Fairfield municipal building generator 3. Fairfield library generator	Engineering Department	Complete		
Fairfield-4: Support mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage with repetitive and severe repetitive loss properties as a priority when applicable.	Engineering Department	No progress. Discontinued to develop actions for specific structures		
Fairfield-5: The Township will establish a community resilience committee/advisor.	Township	No Progress	X	
Fairfield-6: The Township will work with the local school district and assist with identifying joint mitigation projects.	Township	Complete. Schools did not implement due to costs.		

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Fairfield participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Fairfield and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (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 Township of Fairfield 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.8-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.8-18 summarizes the actions by type across hazards of concern.

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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-Fairfield-001	Buyout properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave	Properties are RL and SRL properties	Acquire thirteen (13) properties.	Existing	Flood	2	Engineering Department	FEMA HMA Grants (HMGP, FMA, PDM)	Properties removed from floodplain	\$3 Million	Within 5 years	High	SIP	PP
2020-Fairfield-002	Establish a community resilience committee/ advisor	The township lacks a community resilience committee/ advisor.	The Township will establish a community resilience committee/ advisor.	N/A	All hazards	4, 5	Township	Municipal funds	Position established	\$0	Within 1 year	Low	LPR, EAP	PI
2020-Fairfield-003	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages. These areas are residential, and these properties have been repetitively flooded as documented by paid NFIP claims including 217 RL and 55 SRL properties.	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	Existing	Flood, Severe Storm	2	Floodplain Administrator	FEMA HMGP and FMA, local cost share by residents	Eliminate s flood damage to homes and residents, creates open space for the municipality increasing flood storage.	\$3 Million	3 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
			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).											
2020-Fairfield-004	Power line mitigation	Power lines Township wide are all above ground and vulnerable to damage from tree fallings and wind damage, which	Conduct study to determine if specific areas have more occurrences of downed power lines than others, and work to bury power	Existing	Severe Storm, Severe Winter Storm, Utility Interruption	2	Engineering	Municipal budget, HMGP, CHIPS	Reduction in power outages and property damages	\$3 million per mile of buried line, \$5 for tree trimming	Within 1 year	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
		would cause an interruption to service.	lines or focus tree trimming program on these areas.											
2020-Fairfield-005	Winter storm response improvements	Limited manpower and equipment breakdowns cause delays and complications to efficient storm cleanup.	Purchase new equipment and determine if hiring additional staff is possible. Enact mutual aid agreements with surrounding communities for winter storm cleanup.	N/A	Winter Storms	5	DPW	Municipal budget	Increased storm response capabilities	High	Within 5 years	High	LPR	ES
2020-Fairfield-006	Drainage study for Horseneck Road, Two Bridges Road, and Camp Lane	The following roads experience frequent flood inundation from the Passaic River after prolonged rainfalls along Horseneck	Conduct a drainage study to determine if flooding is primarily caused from stormwater runoff or riverine cresting. Implement drainage	Existing	Flood, Severe Storm	4	Engineering	HMGP, BRIC, municipal budget	Reduction in flooding	TBD by study	Within 5 years	Medium	LPR, SIP	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
		Road between the Route 80 underpass and North Jersey Gun Club; Two Bridges Road; Camp Lane.	solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations.											
2020-Fairfield-007	Drainage study for flash flooding prone roadways	Flash flooding during heavy rainfalls occurs along the following roadways: <ul style="list-style-type: none"> •Passaic Ave •Dwight Place •Washington and Lincoln near the Green Brook 	Conduct a drainage study to determine cause of stormwater flooding. Implement drainage solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations. Additional options may be to	Existing	Flood, Severe Storm	2, 4	Engineering	HMGP, BRIC, municipal budget	Reduction in flash flooding	TBD by study	Within 5 years	Medium	LPR, SIP	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
			perform frequent maintenance on the surrounding sewer systems to ensure they are functioning properly and free of debris and blockages.											
2020-Fairfield-008	Conduct outreach to Essex County Airport	Essex County Airport is located in the 1-percent floodplain	Educate property owner on flood risk and options for mitigation. Work with owner to develop applications for grant funding to help owner obtain funding for mitigation measures.	Existing	Flood	3, 4	Floodplain Administrator, property owner	Municipal budget	Reduction in flood exposure of medical facility	\$200	6 months	Medium	EAP	PI
2020-Fairfield-009	Flood study and mitigation of Volunteer Fire Department Station 2	Fairfield Volunteer Fire Department Station 2 is located in	Conduct study to determine if Volunteer Fire Department	Existing	Flood	2, 6	Engineering	BRIC, municipal budget,	Reduction in flood exposure to pump stations	\$15,000	2 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
		the 1-percent floodplain	Station 2 is protected against impacts from flooding. If determined to be vulnerable, floodproof the structure to ensure the pump remains functional during an event.											
2020-Fairfield-010	Conduct outreach to Medicare of Fairfield	Medicare of Fairfield is located in the 1-percent floodplain.	Educate property owner on flood risk and options for mitigation. Work with owner to develop applications for grant funding to help owner obtain funding for mitigation measures.	Existing	Flood	3	Floodplain Administrator, property owner	Municipal budget	Reduction in flood exposure of medical facility	\$200	6 months	Medium	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-Fairfield-011	Flood study and mitigation of pump stations	Numerous pump stations are located in the 1-percent floodplain: Madison Road Sewer Pump Station, Riveredge Drive Sewer Pump Station, Big Piece Road Sewer Pump Station, Ray Place Sewer Pump Station	Conduct study to determine if pump stations are protected against impacts from flooding. If determined to be vulnerable, floodproof the structure to ensure the pump remains functional during an event.	Existing	Flood	2, 6	Engineering	BRIC, municipal budget	Reduction in flood exposure to pump stations	\$15,000 per pump station	2 years	High	SIP	PP
2020-Fairfield-012	Conduct outreach to school boards	Several schools are located in the 1-percent floodplain: Adlai E. Stevenson Elementary School, Banyan School, Glenview Academy,	The floodplain administrator will educate property owners on flood risk and options for mitigation. Work with owner to develop	Existing	Flood	3	Floodplain Administrator, school boards	Municipal budget	Reduction in flood exposure	\$200	6 months	Medium	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
		The Gramon School	applications for grant funding to help owner obtain funding for mitigation measures.											
2020-Fairfield-013	Conduct outreach to flood prone gas stations	Several gas stations are located in the 1-percent floodplain: Fairfield Delta Gas Station, Ralstons Sunoco Gas Station, Valero Gas Station	The floodplain administrator will educate property owners on flood risk and options for mitigation. Work with owner to develop applications for grant funding to help owner obtain funding for mitigation measures.	Existing	Flood	3	Floodplain Administrator, private property owners	Municipal budget	Reduction in flood exposure	\$200	6 months	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

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 9.8-17. 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-Fairfield-001	Buyout properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Fairfield-002	Establish a community resilience committee/advisor.	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	High
2020-Fairfield-003	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-Fairfield-004	Power line mitigation	0	1	1	1	1	1	0	0	1	1	0	0	1	1	9	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-Fairfield-005	Winter storm response improvements	1	1	0	1	1	1	1	1	1	1	0	0	1	1	11	High
2020-Fairfield-006	Drainage study for Horseneck Road, Two Bridges Road, and Camp Lane	0	1	0	1	1	1	0	1	0	0	1	0	1	1	8	Medium
2020-Fairfield-007	Drainage study for flash flooding prone roadways	0	1	0	1	1	1	0	1	0	0	1	0	1	1	8	Medium
2020-Fairfield-008	Conduct outreach to Essex County Airport	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High
2020-Fairfield-009	Flood study and mitigation of Volunteer Fire Department Station 2	0	1	1	1	1	1	-1	0	1	1	0	1	1	1	10	High
2020-Fairfield-010	Conduct outreach to Medicare of Fairfield	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High
2020-Fairfield-011	Flood study and mitigation of pump stations	0	1	1	1	1	1	-1	0	1	1	0	1	1	1	10	High
2020-Fairfield-012	Conduct outreach to school boards	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High
2020-Fairfield-013	Conduct outreach to flood prone gas stations	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. Low (0-4), Medium (5-8), High (9-14).



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 Erosion and Sea Level Rise			2020-Fairfield-002					
Coastal Storm			2020-Fairfield-002					
Drought			2020-Fairfield-002					
Earthquake			2020-Fairfield-002					
Extreme Temperature			2020-Fairfield-002					
Flood		2020-Fairfield-001, 2020-Fairfield-003, 2020-Fairfield-009, 2020-Fairfield-011	2020-Fairfield-002, 2020-Fairfield-008, 2020-Fairfield-010, 2020-Fairfield-012, 2020-Fairfield-013			2020-Fairfield-006, 2020-Fairfield-007		
Geological Hazards			2020-Fairfield-002					
Severe Weather		2020-Fairfield-003, 2020-Fairfield-004	2020-Fairfield-002			2020-Fairfield-006, 2020-Fairfield-007		
Winter Storm		2020-Fairfield-004	2020-Fairfield-002		2020-Fairfield-005			
Wildfire			2020-Fairfield-002					
Civil Disorder			2020-Fairfield-002					
Cyber Attack			2020-Fairfield-002					
Disease Outbreak			2020-Fairfield-002					
Economic Collapse			2020-Fairfield-002					
Hazardous Substances			2020-Fairfield-002					



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Utility Interruption		2020-Fairfield-004	2020-Fairfield-002					
Terrorism			2020-Fairfield-002					
Transportation Failure			2020-Fairfield-002					

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.8.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Fairfield 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. . In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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
William Smith	OEM Coordinator	Primary POC, provided update on the mitigation strategy, attended meetings, reviewed and provided comments on draft.
Steve Bury	Engineer	Alternate POC
Phil Cheff	Construction Official	NFIP FPA



Figure 9.8-1. Township of Fairfield Hazard Area Extent and Location Map

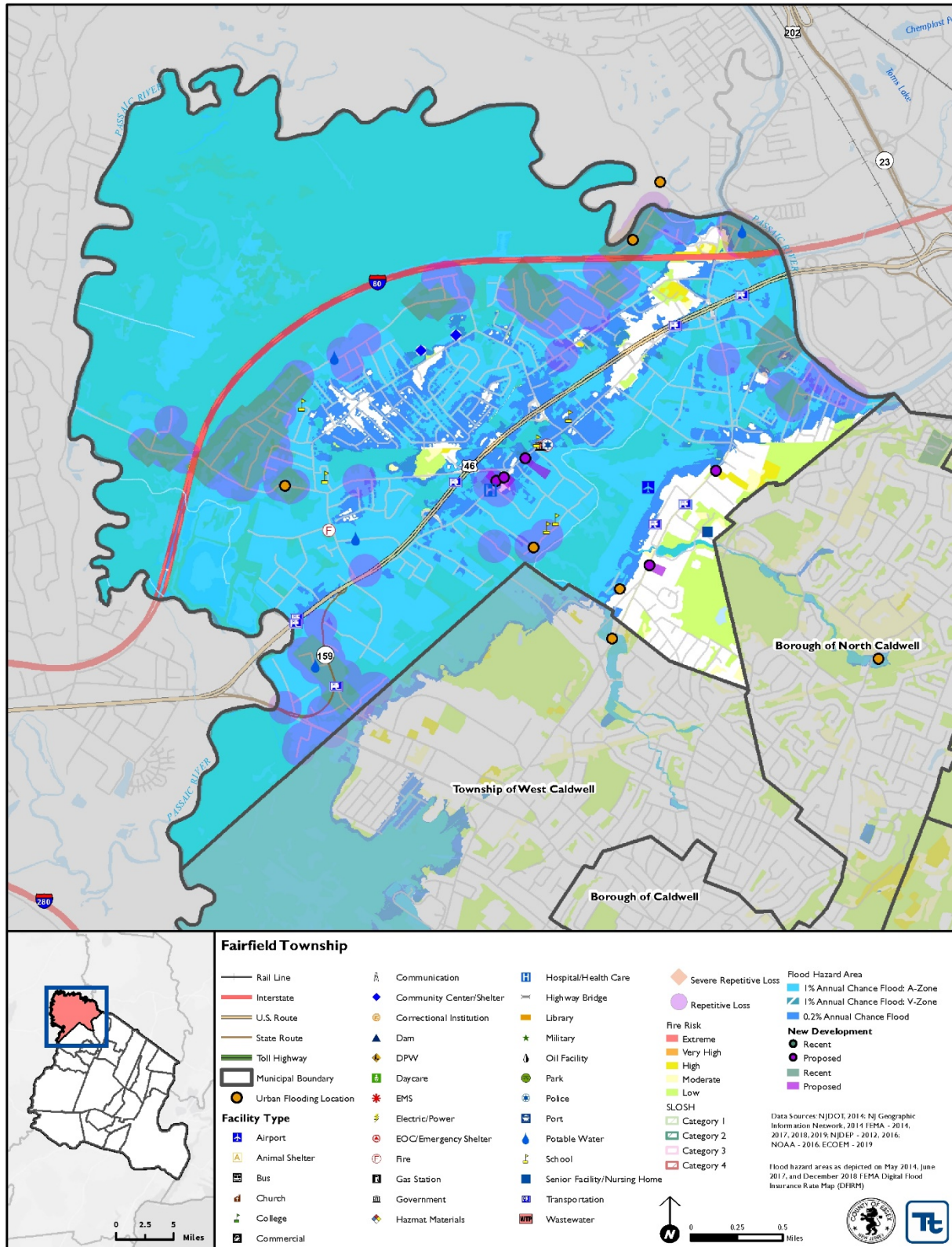
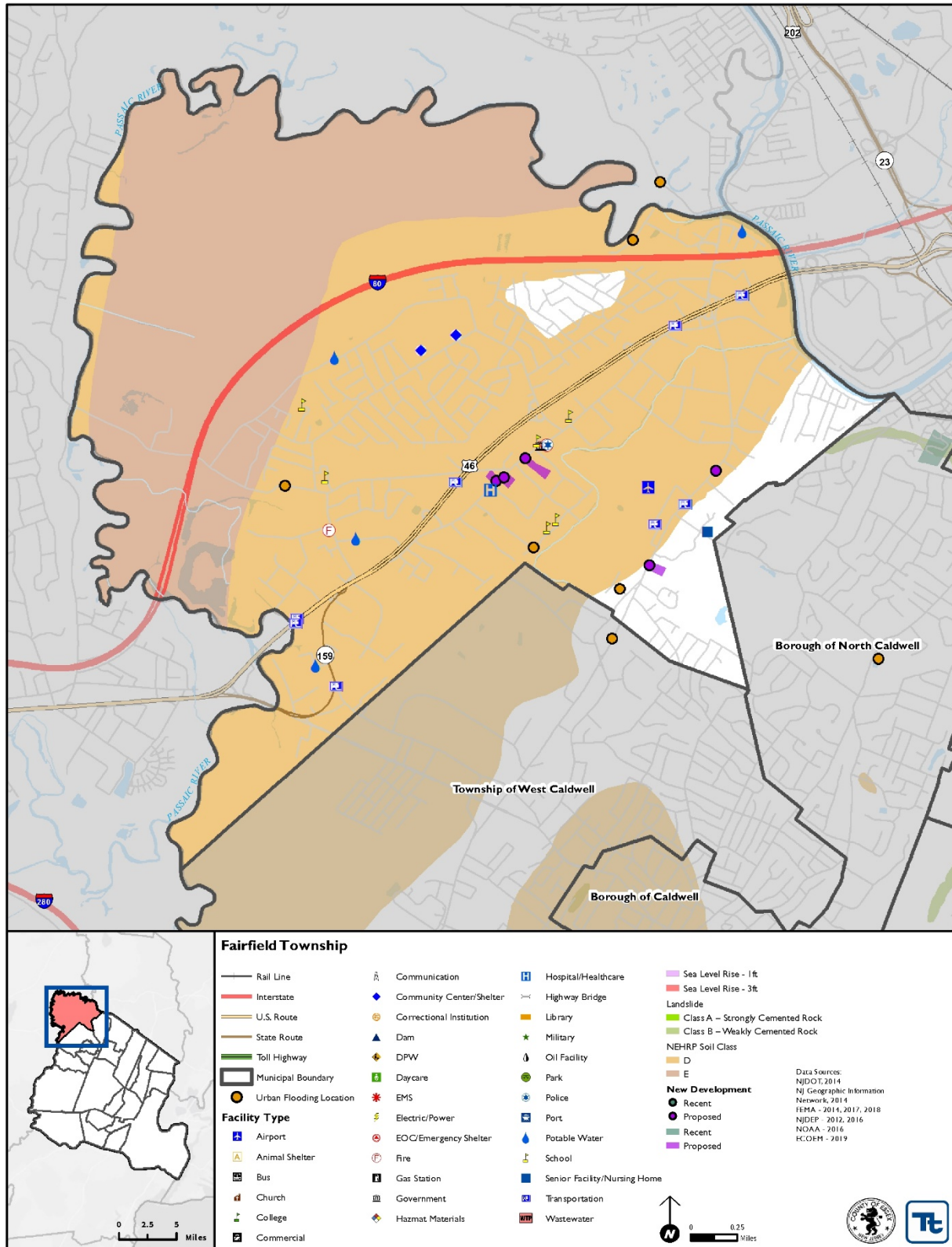




Figure 9.8-2. Township of Fairfield Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Buyout properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave		
Project Number:	2020-Fairfield-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted to thirteen properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave. These areas are residential, and these properties are repetitive loss and severe repetitive loss properties as documented by paid NFIP claims.		
Action or Project Intended for Implementation			
Description of the Solution:	Collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition of 13 properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
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	Goals Met:	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:	Buyout properties located on Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave		



Project Number:	2020-Fairfield-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 Camp Lane, Riveredge Dr, Horseneck Rd, and Park Ave area of Town.
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:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Fairfield-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	<p>Frequent flooding events have resulted in damages in the following areas:</p> <ul style="list-style-type: none"> • Addison Drive • Beach Ave • Oak Street • Pier Lane • Sea Breeze Road • Sylvan Road • West Drive • Angeline Court • Butz Ave • Big Piece Road • Bloomfield Ave • Broadway • Camp Lane • Carl Drive • Club Road • Cole Road • Clinton Road • Carlos Drive • Courter Place • Dwight Place • Glenroy Road • Horseneck Road • Little Falls Road • Long Acres Road • Matt Drive • Pier Lane • Ray Place • Riveredge Drive • Ramkay Drive • Sylvan Road • Tuscany Terrace <p>These areas are residential, and these properties have been repetitively flooded as documented by paid NFIP claims.</p>		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners (217 RL, 55 SRL) 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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
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:	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:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Fairfield-003	
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 flood prone area of Township.
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:	Power line mitigation		
Project Number:	2020-Fairfield-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Utility Interruption		
Description of the Problem:	Power lines Townshipwide are all above ground and vulnerable to damage from tree fallings and wind damage, which would cause an interruption to service.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct study to determine if specific areas have more occurrences of downed power lines than others, and work to bury power lines or focus tree trimming program on these areas.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Reduction in property damage, utility Interruption
Useful Life:	1 year for tree trimming, 50 years for burying lines	Goals Met:	2
Estimated Cost:	\$3 million per mile of buried line, \$5 for tree trimming	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, PDM, CHIPS
Responsible Organization:	Engineering	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
	Ask residents to alert township to dangerous trees.	\$1,000	Reactive. Likely to miss most trees.
	Remove all trees along areas with powerlines and property	N/A	Not feasible/environmentally damaging
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Power line mitigation	
Project Number:	2020-Fairfield-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Project will protect utilities from falling tree damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to conduct the project
Fiscal	0	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	Restore natural floodplain function
Total	9	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Drainage study for Horseneck Road, Two Bridges Road, and Camp Lane		
Project Number:	2020-Fairfield-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The following roads experience frequent flood inundation from the Passaic River after prolonged rainfalls along Horseneck Road between the Route 80 underpass and North Jersey Gun Club; Two Bridges Road; Camp Lane.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a drainage study to determine if flooding is primarily caused from stormwater runoff or riverine cresting. Implement drainage solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by drainage study	Goals Met:	4
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	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:	Drainage study for Horseneck Road, Two Bridges Road, and Camp Lane	
Project Number:	2020-Fairfield-006	
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 Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Drainage study for flash flooding prone roadways		
Project Number:	2020-Fairfield-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Flash flooding during heavy rainfalls occurs along the following roadways: <ul style="list-style-type: none"> •Passaic Ave •Dwight Place •Washington and Lincoln near the Green Brook 		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a drainage study to determine cause of stormwater flooding. Implement drainage solutions, including drainage basins and increased sewer capacity to carry excess stormwater away from these locations. Additional options may be to perform frequent maintenance on the surrounding sewer systems to ensure they are functioning properly and free of debris and blockages.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by drainage study	Goals Met:	2, 4
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	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:	Drainage study for flash flooding prone roadways	
Project Number:	2020-Fairfield-007	
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 Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Flood study and mitigation of Volunteer Fire Department Station 2		
Project Number:	2020-Fairfield-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Fairfield Volunteer Fire Department Station 2 is located in the 1-percent floodplain.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct study to determine if Volunteer Fire Department Station 2 is protected against impacts from flooding. If determined to be vulnerable, floodproof the structure to ensure the pump remains functional during an event.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	1-percent plus 2 feet	Estimated Benefits (losses avoided):	Reduction in flood exposure to fire station
Useful Life:	50 years	Goals Met:	2, 6
Estimated Cost:	\$15,000	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 year	Potential Funding Sources:	BRIC, municipal budget
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
	Relocate fire station	N/A	Fire station needs to remain in current location to keep response times low
	Purchase deployable floodwall	\$15,000	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:	Flood study and mitigation of Volunteer Fire Department Station 2	
Project Number:	2020-Fairfield-009	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Protects fire station
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The township has the legal authority to complete the project
Fiscal	-1	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	2 years
Agency Champion	1	Engineering
Other Community Objectives	1	Protection of critical facilities
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Flood study and mitigation of pump stations		
Project Number:	2020-Fairfield-011		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Numerous pump stations are located in the 1-percent floodplain: Madison Road Sewer Pump Station, Riveredge Drive Sewer Pump Station, Big Piece Road Sewer Pump Station, Ray Place Sewer Pump Station		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct study to determine if pump stations are protected against impacts from flooding. If determined to be vulnerable, floodproof the structure to ensure the pump remains functional during an event.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	1-percent plus 2 feet	Estimated Benefits (losses avoided):	Reduction in flood exposure to pump stations
Useful Life:	50 years	Goals Met:	2, 6
Estimated Cost:	\$15,000 per pump station	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 year	Potential Funding Sources:	BRIC, municipal budget
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
	Relocate pump stations	N/A	Pump stations need to remain in current locations
	Purchase deployable floodwall	\$15,000	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:	Flood study and mitigation of pump stations	
Project Number:	2020-Fairfield-011	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Protects pump stations
Cost-Effectiveness	1	



Technical	1	
Political	1	
Legal	1	The township has the legal authority to complete the project
Fiscal	-1	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	1	2 years
Agency Champion	1	Engineering
Other Community Objectives	1	Protection of critical facilities
Total	10	
Priority (High/Med/Low)	High	



BOROUGH OF GLEN RIDGE

MUNICIPALITY AT A GLANCE

Total Population: **7,668**
 Total Land Area: **1.3 sq mi**
 Total # Buildings: **2,256**



1% Annual Chance Flood



102

Population Residing
in Floodplain



2

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$691 Thousand

Potential Building Damages



\$1.2 Million

Potential
Building Damages



0

Critical Facilities
in Floodplain

NFIP Statistics



43 # NFIP
Policies

1 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection,
Public Education/Awareness,
Structural Projects

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9.9 BOROUGH OF GLEN RIDGE

This section presents the jurisdictional annex for the Borough of Glen Ridge. The annex includes a general overview of the Borough; an assessment of the Borough’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 Borough of Glen Ridge’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: Michael Rohal, Borough Administrator / Engineer / Clerk / QPA / Emergency Management Coordinator Address: 825 Bloomfield Ave., Glen Ridge, NJ 07028 Phone Number: 973-748-0303 Email: mjrohal@glenridgenj.org	Name / Title: Michael Zichelli, Deputy Administrator / Director of Planning Address: 825 Bloomfield Ave., Glen Ridge, NJ 07028 Phone Number: 973-748-8400 ext. 235 Email: mpzichelli@glenridgenj.org
NFIP Floodplain Administrator	
Name / Title: Michael Rohal, Borough Administrator / Engineer / Clerk / QPA / Emergency Management Coordinator Address: 825 Bloomfield Ave., Glen Ridge, NJ 07028 Phone Number: 973-748-0303 Email: mjrohal@glenridgenj.org	

9.9.2 Jurisdiction Profile

In 1666, 64 Connecticut families bought land from the Lenni Lenape Tribe and named the newly acquired area New Ark. This was to reflect the ability for all to worship freely. The area was originally part of Bloomfield but when residents were unsatisfied with their representation in the local government, they formed their own community in 1895. Throughout the 19th Century, Glen Ridge transformed from rural farming area into a suburban community with the expansion of mass transportation. Today, the Borough is governed under the Borough form of New Jersey municipal government. This form of government has a six member Borough Council and a mayor.



The Borough of Glen Ridge is located in northwestern Essex County. It is situated between Montclair Township and Bloomfield Township. It is bordered to the south by East Orange, to the north by Bloomfield, to the west by Montclair and to the east by Bloomfield.

According to the U.S. Census, the 2010 population for the Borough of Glen Ridge was 7,527. The estimated 2017 population was 7,668, a 1.9 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.6 percent of the population is 5 years of age or younger and



10.1 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.

9.9.3 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, where available.

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	0	0	1	1
Multi-Family	0	0	0	0	1
Other (commercial, mixed-use, etc.)	0	0	0	0	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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Claris	Residential	110 units - 1 building	277 Baldwin	No	In Progress - first qtr 2020 completion
Medical office building	Commercial	45000 sq. ft - 1 building	311 Bay Ave	No	In Progress - first qtr 2020 completion
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None					

* Only location-specific hazard zones or vulnerabilities identified.

9.9.4 Capability Assessment

The Borough of Glen Ridge 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.



Areas that mitigation is currently integrated are summarized in this subsection. The Borough of Glen Ridge 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 Glen Ridge.

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 and State	Yes	Yes	-
<i>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 building code for the Borough is found in Chapter 15 of the municipal code and the Planning & Development Department enforces. This code includes the Flood Damage Control Regulations (Article 28).</i>					
Zoning Code	Yes	Local and State	Yes	No	Yes – 2020-GLEN RIDGE-001
<i>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 code for the Borough is found in Chapter 17 of the municipal code and the Planning & Development Department enforces</i>					
Subdivisions	Yes	Local and State	Yes	Yes	-
<i>Comment: 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 subdivision code for the Borough is found in Chapter 16 of the municipal code, known as the Land Use Ordinance of Glen Ridge. The code requires that a preliminary plat be prepared and that it shows provisions for sewage disposal, drainage, and flood control. A sketch plat must show existing contours to determine the general slope and natural drainage of the land. The Planning Board of Adjustment and Borough Council are responsible for enforcing this code.</i>					
Stormwater Management	Yes	Local	Yes	Yes	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). The stormwater management code for the Borough is found in Chapter 13 of the municipal code and enforced by the Glen Ridge Police Department and Construction Official. The purpose of this code is to establish minimum stormwater management requirements and controls for major development. This code provides standards for structural stormwater management measures, including having the measures designed to take into account existing site conditions, including environmentally sensitive areas, wetlands, floodprone areas, slopes, depth to seasonal high water table, soil type, permeability and texture, drainage area and patterns; and the presence of carbonate rocks. It requires design and performance standards to control erosion, encourage and control infiltration and ground recharge, and control stormwater runoff quantity impacts of major development. It requires a design engineer to show that any increased volume or change in timing of stormwater runoff will not increase flood damage or downstream of the proposed site.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes	-
<i>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.</i>					
Growth Management			Yes	Yes/No	Yes/No
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					



	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 #.
Site Plan Review	Yes	Local	Yes	Yes	-
<i>Comment: Chapter 16.24 (Subdivision and Site Plan Review) is enforced by the Planning Board. An application for subdivision or site plan review must be filed with the administrative officer at least two weeks before a regular meeting of the planning board. A preliminary plat must include a statement setting the provisions for sewage disposal, drainage, and flood control. Site plan review is required prior to the issuance of permits or certificate of occupancy for any development except for detached one- or two-family dwellings.</i>					
Environmental Protection	Yes	Local	Yes	Yes	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. The Borough has the following codes related to environmental protection: Chapter 12.26 – Shade Tree Commission – The Commission regulates, plants, cares and controls shade and ornamental trees and woody shrubs on the streets and public access areas of the Borough. This allows for activities such as travel, active and passive recreation, and flood control. The Commission is made up of five members. Chapter 12.28 – Shade Trees</i>					
Flood Damage Prevention	Yes	Local	No	-	-
<i>Comment: Chapter 15 Article 28 of the municipal code, amended by Ordinance No. 1141 effective 1987. The Borough requires a development permit before construction or development begins within any area of special flood hazard. The Borough Engineer is identified as the floodplain administrator and implements the flood damage prevention ordinance. The ordinance requires all new construction and substantial improvements in the SFHA be anchored to prevent flotation, collapse, or lateral movement of the structure; be constructed with materials and utility equipment resistant to flood damage; lowest floor, including basement, elevated to or above the base flood elevation; and requirements for new replacement water supply systems</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: The 2010 Master Plan Reexamination identified goals that including: promote a balanced variety of residential, commercial, recreational, public, and conservation land uses; and continue to improve community facilities and services that maintains the quality of life for residents. The plan promotes consistency between plans, including the zoning code and surrounding municipalities. It looks at several different elements: land use; housing; community facilities; parks, recreation, and open space; circulation; utility service; historic preservation; sustainability; and compatibility with other planning efforts. The sustainability element has objectives related to climate change (reducing greenhouse gas emissions and reduce dependency on fossil-fuel vehicles), preserving and enhancing water quality, minimizing change to natural systems, and control excess runoff.</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>Comment: Per NJS 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. The Borough's CIP is part of their annual budget.</i>					
Disaster Debris Management Plan	Yes	Local	No	-	-
<i>Comment: The plan is currently under review by Essex County</i>					



	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	-	-
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes	-
<i>Comment: Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Borough's plan identified strategies 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 development, defined as projects that disturb one or more acre of land. One of the goals of the plan is to reduce flood damage including damage to life and property. While it was stated that it is not economically feasible to provide 100-year flood structural protection, the Borough should provide flood protection against more frequent, low magnitude storm events where possible. If a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge.</i>					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
<i>Comment: The plan was completed on January 15, 2018 by the municipal engineer. The plan states that the Borough ensures all new residential development and redevelopment projects are subject to the Residential Site Improvement Standards for stormwater management. The Borough's planning and zoning boards ensures compliance before issuing subdivision or site plan approvals. The Borough provides informational brochures on stormwater management and best management practices. The Public Works Department monitors all their roads and streets for erosion problems. Once identified, a repair schedule will be developed. The Borough has developed an annual catch basin cleaning program to maintain function and efficiency.</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	Yes	Local	No	No	No
<i>Comment: This is part of the Borough's Master Plan</i>					
Shoreline Management Plan	No	-	No	-	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	Yes	Local	No	Yes	-
<i>Comment: Through the Shade Tree Commission - The Commission regulates, plants, cares and controls shade and ornamental trees and woody shrubs on the streets and public access areas of the Borough. This allows for activities such as travel, active and passive recreation, and flood control. The Community Forestry Management Plan 2015-2019 was prepared in cooperation with the Borough's Shade Tree Commission.</i>					
Transportation Plan	Yes	Local	No	No	No
<i>Comment: Part of the Borough's master plan</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	No	-	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 #.
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	-	Yes	-	-
<i>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.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	Yes	Local	No	-	-
<i>Comment: Part of the Borough's EOP</i>					
Continuity of Operations Plan	Yes	Local	No	-	-
<i>Comment: Part of the Borough's EOP</i>					
Public Health Plan	-	-	-	-	-
<i>Comment:</i>					
Other	-	-	-	-	-
<i>Comment:</i>					

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 – Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes – the Borough has the ability to do so
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 – however, the Borough is fully developed and there is no developable land. All remaining land has environmental restrictions (e.g. floodplain or green acres)

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Glen Ridge.



Table 9.9-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Borough of Glen Ridge Planning Board
Mitigation Planning Committee	Yes	During the five-year update of the Essex County HMP
Environmental Board / Commission	Yes	Environmental Advisory Committee – the committee has established, consistently maintained and participated in the Go Glen Ridge Green website (www.goglenridgegreen.org/), provided funding for environmental film screenings, and have actively participated and promoted cleanups at our Glen and other places in the County.
Open Space Board / Committee	No	
Economic Development Commission / Committee	No	
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle, email announcements, broadcasts, social media (Facebook and Twitter), municipal website, outdoor message boards
Maintenance program to reduce risk	Yes	Catch basin cleaning, tree trimming
Mutual aid agreements	Yes	Surrounding municipalities and Essex County; continues to enhance and maintain existing agreements
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Administrator
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer and consultant engineer
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer and consultant engineer
Staff with training in benefit/cost analysis	Yes	Borough Administrator and Deputy Administrator
Staff with training in green infrastructure	-	-
Staff with education/knowledge/training in low impact development	-	-
Surveyors	Yes	Contract engineering firm
Stormwater engineer	Yes	Borough Engineer
Personnel skilled or trained in GIS applications	Yes	Contract engineering firm
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Borough Administrator
Grant writers	Yes	-
Resilience Officer	No	-
Watershed planner	-	-
Environmental specialist	-	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Glen Ridge.

Table 9.9-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes, but not eligible for infrastructure
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 – water; sewer is part of the Borough’s taxes but not a separate bill; gas and electric is through PSE&G
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes - utility fees (connection fees) for development and affordable housing fee for developers
Clean Water Act 319 Grants (Nonpoint Source Pollution)	-
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Borough of Glen Ridge.

Table 9.9-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes – PIO through the Police Department
Do you have personnel skilled or trained in website development?	Yes – contracted out
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – the Office of Emergency Management site has links to the various resources on hazards (e.g. FEMA, Essex County)
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – Facebook and twitter; email broadcast system used for general and emergency information such as road closures
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – Borough TV station, local newspaper, postings on sign boards
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes - Nixle, email announcements, broadcasts, social media (Facebook and Twitter), municipal website, outdoor message boards

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Glen Ridge.

Table 9.9-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	-	-	-
Public Protection (Fire ISO Protection Class)	-	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-



Program	Participating?	Classification	Date Classified
Sustainable Jersey	Yes	Silver	October 30, 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?
- Is the administrative supportive of integrating climate change in policies or actions?
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality?

Table 9.9-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	N/A
Coastal Storm (Hurricane, Tropical Storm, Nor'Easter)	N/A
Drought	Medium
Earthquake	Low
Extreme Temperature	Medium
Flood	Medium
Geological hazards (landslide, subsidence, sinkholes)	Medium
Severe Weather	High
Severe Winter Weather	High
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	High
Disease Outbreak (West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus)	Medium
Economic Collapse (new)	Medium
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure (vehicular accidents, aviation accidents, railway failures and accidents, roadway and bridge failures)	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 9.9-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	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?	1987
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets minimum
When was the most recent Community Assistance Visit or Community Assistance Contact?	To date, a CAV or CAC has not been conducted for the Borough.
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 – training and assistance is always welcome; the FPA does attend trainings as available
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; however, the Borough is interested in joining the CRS program
How many flood insurance policies are in force in your jurisdiction?*	43
• What is the insurance in force?	\$11,991,000
• What is the premium in force?	\$58,385
How many total loss claims have been filed in your jurisdiction?***	18
• How many claims are still open or were closed without payment?	5 CWOP
• What were the total payments for losses?	\$38,521.46
Do you maintain a list of properties that have been damaged by flooding?	Yes - the Borough maintains records of properties that sustained damage as a result of flooding.
Do you maintain a list of property owners interested in flood mitigation?	No

*According to FEMA statistics as of July 31, 2019

**According to FEMA statistics as of April 30, 2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

- The Borough uses the current HMP to include hazard information into municipal codes and plans, including the master plan.
- **Sustainable Jersey** - 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 is empowering communities to build a better world. Municipalities can receive Sustainable Jersey certification. There are two levels of certification – bronze and silver. The Borough of Glen Ridge is a silver certified community that became certified on October 30, 2019.
- **Green Team** - The Mayor & Council reauthorized the Environmental Advisory as of the Living Green Team for the Borough on September 10, 2018. Membership includes a representative from





Council & the Board of Education, Borough Administrator and residents. The Committee meets the second Tuesday of each month. Some of the activities of the Committee are the Eco-Fair, environmental lecture series, pruning training at the Freeman Gardens, clean energy talks, film screenings, cleanups at the Glen, and constant updates to the Go Glen Ridge Green website and Facebook page. The Committee has also prompted the sale of canvas bags, composting bins and rain barrels in the Borough. Included in the attachments is the recently passed resolution, meeting notes, and a list of current members.

- **Vulnerable Populations Identification for Emergencies** - Prior to the NJ Registry Ready program, the Borough initiated a local registry program in conjunction with the Bloomfield Human Services as part of a shared service program. The program was started in March 2013. Besides working with the senior association, the Golden Circle and the community assistance program Neighbor to Neighbor. Human Services contacted residents who received senior discounts to inform them of the program. Human Services also contacted the management firms of buildings with large senior populations to notify them of the registry. Upon the implementation of the NJ Register Ready program in 2014, individuals at risk were transferred from the borough to the state data base. At the Borough level, the list is maintained and accessed by the Borough’s Office of Emergency Management.
- **Sustainable Land Use Pledge** – adopted by the Borough Council on May 28, 2019 to allow the Borough to take steps with regard to land use decisions to become a sustainable community.

9.9.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Borough of Glen Ridge’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.9-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. 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)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
May 15, 2018	Thunderstorm Wind	N/A	An approaching cold front triggered numerous severe thunderstorms over northeastern New Jersey. Large trees were reported down in Caldwell. \$4,000 in property damages were reported. Large tree reported down on Maple Street in West Orange. \$4,000 in property damages were reported.	The Borough reported \$28,000 in damages from this event
March 15, 2019	Thunderstorm Wind, Hail	N/A	A cold front moved through the region triggering strong to severe thunderstorms across Northeast New Jersey. A tree down on car on Force Hill Road between East	The Borough reported \$3,000 in damages from this event



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			Mount Pleasant Avenue and Michele Lane. \$6,000 in property damages were reported. Hail of 07.5 inches in diameter reported in West Orange.	

Source: NOAA-NCEI 2019

9.9.6 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 9.9-12 summarizes the Borough risk assessment results and data used to determine the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion Hazard Area (CEHA): Sea Level Rise: NOAA +1ft and +3ft rise	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
		SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$691,490	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	2,0	Category 3:	0	500-year Wind Loss:	\$3,581,584	
		Category 4:	2,0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water suppliers with surface water sources.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	197	NEHRP D&E:	58	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$779,516	
						2,500-year Loss:	\$13,407,246	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	773	Physical impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or utility interruptions.		Low
		Population Below Poverty Level:	291					
Flood	100- and 500-Year Mean Return Period Event	100-year	102	100-year	30	100-year Loss:	\$1,203,509	High
		500-year	105	500-year	31			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	3	Class B:	1	Class B:	\$593,925	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.		The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).		The degree of damages depends on the scale of the incident.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Glen Ridge.

- Number of repetitive loss (RL) properties: 1*
- Number of severe repetitive loss (SRL) properties: 0*
- Number of RL/SRL properties that have been mitigated: 0*

*FEMA, January 7, 2019

CRITICAL FACILITIES AND LIFELINES

No identified critical facilities and lifelines in the community are located in the 1-percent and 0.2-percent floodplains.

Table 9.9-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
None				

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Floodprone areas in the Borough include: Clark Street along a stream; some homes along Ridgewood Avenue, near Cross Street
- Majority of the floodprone areas in the Borough are open space and no structures are exposed or at risk
- The Borough has exhibited severe water quantity problems including flooding and stream bank erosion. Some of the storm sewer system in the Borough is undersized thereby causing a backwater effect and flooding during Severe Weathers.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Glen Ridge 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 Glen Ridge has significant exposure; refer Figure 9.9-1 and 9.9-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Borough of Glen Ridge. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Borough of Glen Ridge has reviewed the Essex 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 adjusted the following hazard rankings: Extreme Temperature (from low to medium), Flood (from low to medium), Cyber Attack (from low to medium), and Economic Collapse (from medium to low). These adjustments were made based on history of previous events.

Table 9.9-14. Borough of Glen Ridge Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Weather	Winter Weather	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Low	High	Low	Low

9.9.7 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 9.9-15. 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 #
Glen Ridge-1	Obtain back-up power for critical facilities in the Borough to maintain continuity of operations: Currently identified location are: 1. Glen Ridge municipal complex which consists of the Police Department, Ambulance Squad, Administrative Offices and Public Library 2. Glen Ridge would like to acquire a tow-behind generator	Engineering Department	Complete - municipal complex generator has been purchased and installed	X	2020-GLEN RIDGE-002
Glen Ridge-2	Tony’s Brook. It is the intent and purpose of this project to make improvements to the retaining walls along Toney’s Brook. This will mitigate damage to private properties.	Department of Public Works	Installed a generator at the public works yard	X	2020-GLEN RIDGE-003
Glen Ridge-3	Power system rehabilitation. It is the intent and purpose of this project to harden the electrical distribution system and make it more resilient. The system is currently in the design phase. Project is designated under PSEG NJ Strong Program.	PSE&G, supported by the Borough	In Progress - private properties are protected; public land still needs improvement - no assets at risk		
Glen Ridge-4	Mountainside Hospital: Continue to provide training at Mountainside Hospital continues to ensure personnel are familiar with and have practice emergency operations procedures.	Public Safety and Merit Health	In Progress by PSE&G - borough does not have jurisdiction over this project		
Glen Ridge-5	Rebuild Bloomfield Avenue bridge which spans the Montclair rail line	Engineering Department	In Progress		
Glen Ridge-6	Rebuild Ridgewood Avenue bridge which spans the Boonton rail line	Engineering Department	In Progress - NJDOT has jurisdiction over this		
Glen Ridge-7	Rebuild Ridgewood Avenue bridge which spans the Montclair rail line	Engineering Department	No progress - but this is a county action – the Borough does not have jurisdiction over this		
Glen Ridge-8	Upgrade and harden electrical distribution system in the south end of the Borough.	Engineering Department	No progress - but this is a county action – the Borough does not have jurisdiction over this		
Glen Ridge-9	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.	Borough Engineering, FPA	In Progress - PSE&G responsibility; upgrading around Borough		



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 #
Glen Ridge-10	The hazard mitigation plan will be used to guide the addition of hazard information for inclusion in the next Master Plan update.	Planning	Ongoing Capability		
Glen Ridge-11	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: <ul style="list-style-type: none"> • Conduct outreach on hazards, • Provide/attend training on grant application preparation; • Reach out to colleges/universities for technical assistance with natural hazard mitigation activities. 	Supervisor's Office	Ongoing Capability		
Glen Ridge-12	Develop and implement a post-event damage assessment program, including the following elements: <ul style="list-style-type: none"> • Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. • Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. • Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Town/Village (e.g. building permit process). 	Borough Engineering, FPA	Ongoing Capability		
Glen Ridge-13	Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.	FPA	Ongoing Capability		
Glen Ridge-14	Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).	FPA	Ongoing Capability		
Glen Ridge-15	Have designated NFIP Floodplain Administrator (FPA), and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).	FPA	Ongoing Capability		



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 #
Glen Ridge-16	Enhance/expand tree maintenance program (under contract with various vendors) and coordination with utilities (e.g., PSEG).	Engineering and DPW	Ongoing Capability		
Glen Ridge-17	Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Borough	Complete and an Ongoing Capability		
Glen Ridge-18	The Borough will keep a list of all properties that experienced damage and had to receive grant money, and a list of all property owners who are interested in mitigation.	Engineering	Complete and an Ongoing Capability		

The Borough did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Glen Ridge participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Glen Ridge participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (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 Borough of Glen Ridge 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.9-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.9-18 summarizes the actions by type across hazards of concern.



Table 9.9-16. 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-GLEN RIDGE-001	Integrate HMP into Zoning Ordinance (Chapter 17)	Problem: The current zoning ordinance for the Borough does not discuss floodplains or other natural hazard impact areas.	New and Existing	All Natural Hazards	1, 2, 5	<u>Borough Council, Planning and Development</u>	Municipal Budget	Promotes development and redevelopment patterns that area at less risk from known natural hazards; reduces potential for future damages associated with natural hazards	<\$5,000	Within 5 years	Medium	LPR	PR
		Solution: During the next update of the zoning ordinance, the Borough will review the current HMP and incorporate natural hazard impact areas. This could include limiting the density of development in the floodplain and requiring undeveloped floodplains be kept as open space.											
2020-GLEN RIDGE-002	Tow-Behind Generator	Problem: Many facilities identified as essential in the Borough do not have backup power. These facilities can be used as shelters and warming/cooling centers.	Existing	All	1, 2, 6	Borough Engineer, Emergency Management	FEMA PDM and HMGP, Municipal Budget	Increases continuity of operations, provides shelter for residents	\$50,000	2 years	High	SIP	PP
		Solution: A permanent generator at each facility is not necessary. The Borough will purchase a tow-behind generator to use at facilities without power.											
2020-GLEN RIDGE-003	Generator for Borough Facility	Problem: The Borough's park annex, recreation center, and borough hall do not have backup power. During power outages, these buildings can provide essential services to the community and residents.	Existing	All	1, 2, 6	Borough Engineer, Emergency Management	FEMA PDM and HMGP, Municipal Budget	Increases continuity of operations, provides essential services to the community	\$100,000	2 years	High	SIP	PP
		Solution: Purchase and install a generator to power these three facilities during a power outage. They will provide continuity of operations and services to the community.											
2020-GLEN RIDGE-004	Midland Avenue Stormwater System	Problem: Flooding during major storm events have resulted in damages in the area of Midland Avenue and Carteret Street/Madison Avenue.	Existing	Flood, Severe Weather, Coastal Storm	1, 2	<u>NFIP Floodplain Administrator, Engineer</u>	Municipal Budget	Minimizes flood damage to homes and residents.	\$50,000 - \$70,000	1 year	High	SIP	PP
		Solution: Improvement and extension of the stormwater system on Midland Ave.											
2020-GLEN	Toney's Brook	Problem: Retaining walls along the brook are eroding. The brook is a conduit for	Existing	Flood, Severe	1, 2	<u>NFIP Floodplain</u>	FEMA FMA and	Eliminates flood damage to	\$50,000	3 years	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
RIDGE-005	Infrastructure Repair	stormwater runoff through center of the Borough. Solution: Create a maintenance program of retaining walls to bolster structural integrity as well as maintenance program to ensure area under the bridge at 710 Bloomfield Avenue is clear of debris.		Weather, Coastal Storm, Geological Hazards		<u>Administrator, Engineer</u>	HMGP, Municipal Budget	businesses and homes					
2020-GLEN RIDGE-006	Mitigate floodprone properties in the Borough	Problem: Frequent flooding events have resulted in damages in the Midland Avenue area. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. Solution: Conduct outreach to 5 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 Midland Avenue area that experience frequent flooding (high risk areas).	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 3	<u>NFIP Floodplain Administrator</u>	Municipal Budget for outreach, FEMA FMA and HMGP for mitigation measures	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.	<\$10,000 for outreach; \$1 million for mitigation	3 years	Medium	SIP, EAP	PP, 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 9.9-17. 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-GLEN RIDGE-001	Integrate HMP into Zoning Ordinance (Chapter 17)	1	1	1	1	0	1	0	0	0	1	1	1	0	0	8	Medium
2020-GLEN RIDGE-002	Tow-Behind Generator	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High
2020-GLEN RIDGE-003	Generator for Borough Facility	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High
2020-GLEN RIDGE-004	Midland Avenue Stormwater System	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-GLEN RIDGE-005	Toney’s Brook Infrastructure Repair	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-GLEN RIDGE-006	Mitigate floodprone properties in the Borough	1	1	1	1	0	0	0	0	1	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 9.9-18. 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 Erosion and Sea Level Rise	-001	-002, -003				-002, -003		
Coastal Storm	-001	-002, -003, -004, -005, -006	-006			-002, -003, -004, -005, -006		
Drought	-001	-002, -003				-002, -003		
Earthquake	-001	-002, -003				-002, -003		
Extreme Temperature	-001	-002, -003				-002, -003		
Flood	-001	-002, -003, -004, -005, -006	-006			-002, -003, -004, -005, -006		
Geological hazards	-001	-002, -003, -005				-002, -003, -005		
Severe Weather	-001	-002, -003, -004, -005, -006	-006			-002, -003, -004, -005, -006		
Severe Winter Weather	-001	-002, -003				-002, -003		
Wildfire	-001	-002, -003				-002, -003		
Civil Disorder		-002, -003				-002, -003		
Cyber Attack		-002, -003				-002, -003		
Disease Outbreak		-002, -003				-002, -003		
Economic Collapse		-002, -003				-002, -003		
Hazardous Substances		-002, -003				-002, -003		
Utility Interruption		-002, -003				-002, -003		
Terrorism		-002, -003				-002, -003		
Transportation Failure		-002, -003				-002, -003		

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.9.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Glen Ridge 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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
Sean Quinn	Police Captain	Reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy
Michael Rohal	Borough Administrator / Engineer / Clerk / QPA /	Primary POC, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy



Entity	Title	Method of Participation
	Emergency Management Coordinator	
Michael Zichelli	Deputy Administrator / Director of Planning	Alternate POC, reviewed annex, attended plan participant meetings, provided impact data, contributed to the mitigation strategy



Figure 9.9-1. Borough of Glen Ridge Hazard Area Extent and Location Map

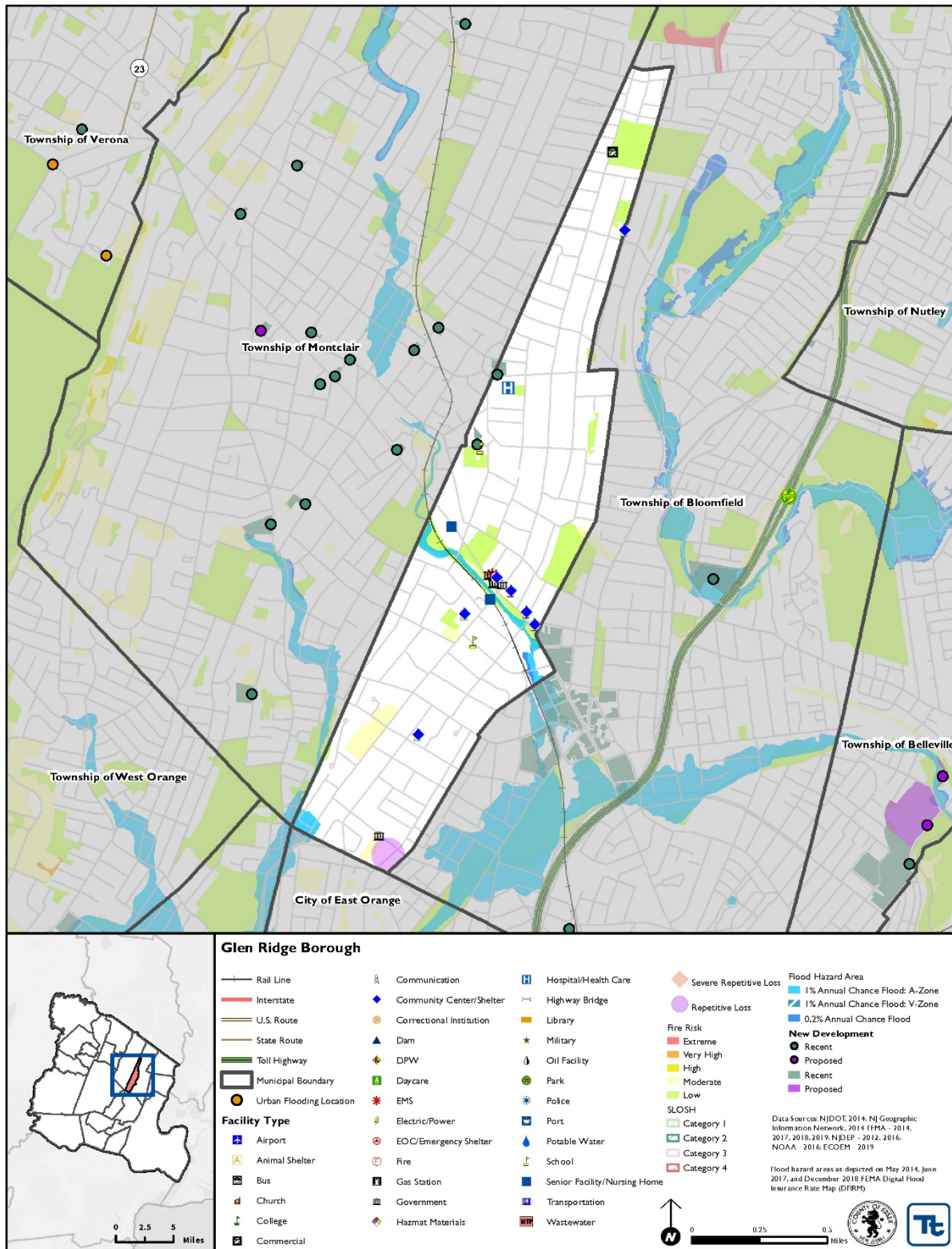
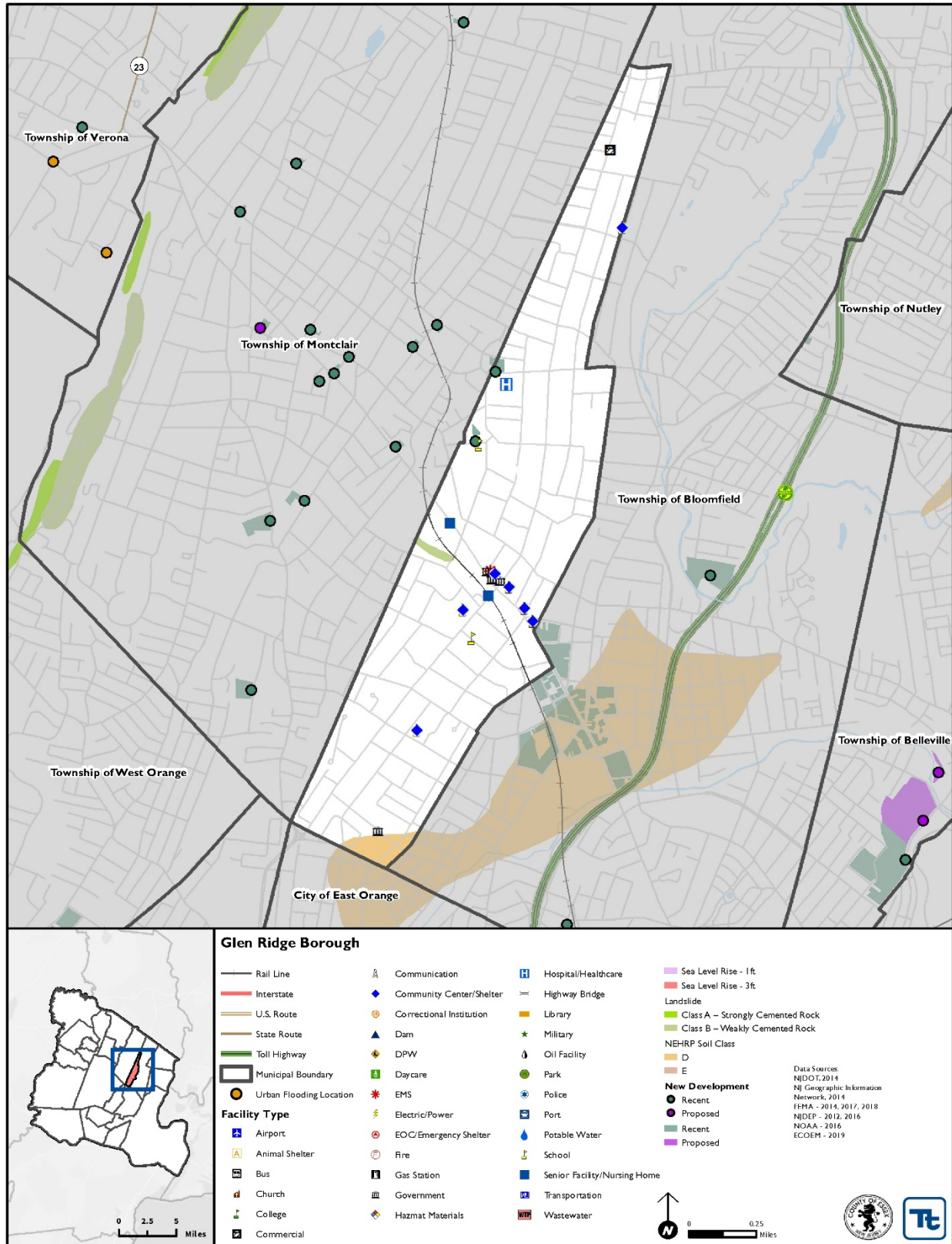




Figure 9.9-2. Borough of Glen Ridge Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Tow-Behind Generator		
Project Number:	2020-GLEN RIDGE-002		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	Many facilities identified as essential in the Borough do not have backup power. These facilities can be used as shelters and warming/cooling centers.		
Action or Project Intended for Implementation			
Description of the Solution:	A permanent generator at each facility is not necessary. The Borough will purchase a tow-behind generator to use at facilities without power.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Increases continuity of operations, provides shelter for residents
Useful Life:	5	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA PDM and HMGP, Municipal Budget
Responsible Organization:	Borough Engineer, Emergency Management	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	\$1 million+	Weather dependent; not good for long-term power outages
	Install wind turbines at each facility	\$1 million+	each facility would need a turbine; weather dependent; not suitable for long-term outages
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Tow-Behind Generator	
Project Number:	2020-GLEN RIDGE-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Allow buildings to function during power outages
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need funding to complete project
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	All
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Generator for Borough Facility		
Project Number:	2020-GLEN RIDGE-003		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	The Borough's park annex, recreation center, and borough hall do not have backup power. During power outages, these buildings can provide essential services to the community and residents.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install a generator to power these three facilities during a power outage. They will provide continuity of operations and services to the community.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Increases continuity of operations, provides essential services to the community
Useful Life:	30	Goals Met:	1, 2, 6
Estimated Cost:	\$100,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA PDM and HMGP, Municipal Budget
Responsible Organization:	Borough Engineer, Emergency Management	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	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
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 for Borough Facility	
Project Number:	2020-GLEN RIDGE-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provide essential services to residents during power outages
Property Protection	1	Keep essential facilities running during power outages
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Need funding to complete project
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	All
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Toney's Brook Infrastructure Repair		
Project Number:	2020-GLEN RIDGE-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm, Geological Hazards		
Description of the Problem:	Retaining walls along the brook are eroding. The brook is a conduit for stormwater runoff through center of the Borough.		
Action or Project Intended for Implementation			
Description of the Solution:	Create a maintenance program of retaining walls to bolster structural integrity as well as maintenance program to ensure area under the bridge at 710 Bloomfield Avenue is clear of debris.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Eliminates flood damage to businesses and homes
Useful Life:	20	Goals Met:	1, 2
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	12-18 months
Estimated Time Required for Project Implementation:	3 years	Potential Funding Sources:	FEMA FMA and HMGP, Municipal Budget
Responsible Organization:	NFIP Floodplain Administrator, 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
	Replace all retaining walls	\$50,000+	Long-term project; costly
	Elevate structures in this area of the Borough	\$1 million	costly; not 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:	Toney's Brook Infrastructure Repair	
Project Number:	2020-GLEN RIDGE-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce risk of flooding to residents in area
Property Protection	1	Reduce risk of flooding to area
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	Technically feasible project
Political	1	
Legal	1	Borough has legal authority to conduct project
Fiscal	0	Requires funding
Environmental	1	
Social	1	
Administrative	-1	
Multi-Hazard	1	Flood, Severe Weather, Coastal Storm, Geological Hazards
Timeline	0	3 years
Agency Champion	1	Floodplain Administrator
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate floodprone properties in the Borough		
Project Number:	2020-GLEN RIDGE-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the Midland Avenue area. 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 5 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 Midland Avenue area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	depends on mitigation option	Goals Met:	1, 2, 3
Estimated Cost:	<\$10,000 for outreach; \$1 million for mitigation	Mitigation Action Type:	SIP, EAP
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	12 months
Estimated Time Required for Project Implementation:	3 years	Potential Funding Sources:	Municipal Budget for outreach, FEMA FMA and HMGP for mitigation measures
Responsible Organization:	NFIP Floodplain 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 flood walls around the properties	50000	Long-term project; not cost effective since these properties are not frequently flooded
	Elevate roadways	\$1 million	costly; not 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:	Mitigate floodprone properties in the Borough	
Project Number:	2020-GLEN RIDGE-006	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protect residents from flood damages
Property Protection	1	Protect structures from flood damages
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	Technically feasible project
Political	0	
Legal	0	
Fiscal	0	Requires funding to conduct mitigation
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Coastal Storm
Timeline	1	3 years
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	



TOWNSHIP OF IRVINGTON

MUNICIPALITY AT A GLANCE

Total Population: **54,715**
 Total Land Area: **2.9 sq mi**
 Total # Buildings: **7,934**



1% Annual Chance Flood



263

Population Residing
in Floodplain



66

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$3.4 Million

Potential Building Damages



\$3.5 Million

Potential
Building Damages



0

Critical Facilities
in Floodplain

NFIP Statistics



47 # NFIP
Policies

12 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Property Protection, Natural Resource
Protection, Emergency Services, Structural
Projects

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9.10 TOWNSHIP OF IRVINGTON

This section presents the jurisdictional annex for the Township of Irvington. The annex includes a general overview of the Township of Irvington; an assessment of the Township of Irvington’s risk and vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to hazards.

9.10.2 Hazard Mitigation Planning Team

The following individuals are the Township of Irvington’s identified hazard mitigation plan 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: John F. Brown, OEM Coordinator Address: 1 Civic Square Irvington NJ, 07111 Phone Number: 973-399-6554 Email: JBrown@Irvingtonnj.org	Name / Title: Antonio Gary, Fire Chief/Deputy Coordinator Address: 1 Civic Square Irvington NJ, 07111 Phone Number: 973-416-5677 Email: AGary@irvingtonnj.org
NFIP Floodplain Administrator	
Name / Title: John Wiggins, Engineer Address: 1 Civic Square Irvington NJ, 07111 Phone Number: 973-399-6696 Email: jwiggins@irvingtonnj.org	

9.10.3 Jurisdiction Profile

Township of Irvington has a total land area of 2.930 square miles of which 2.928 square miles is land and 0.002 square miles is water. The bordering communities are Maplewood to the West, Newark to the East, South Orange to the Northwest, and Union and Hillside to the Southwest. The Elizabeth River cuts through the Township and passes Civic Square and Clinton Cemetery. The Garden State Parkway runs south west to northeast through the Township.

The area now known as the Township of Irvington has significant ties to the Revolutionary War when it was known as Clinton Township and later Camptown. What was known as Camptown in 1834 included Irvington, Maplewood, and parts of Newark and South Orange. The name of the Township was changed after the iconic “Camptown Races” ballad written by Stephen Foster in 1850 was published. In order to avoid any association with the song, the name of the Township was changed to Irvington in honor of the author Washington Irving. In 1874, New Jersey approved the political area to be known as the Village of Irvington. On March 2, 1898, Irvington was incorporated as a Town, replacing Irvington Village.

According to the U.S. Census, the 2010 population for the Township of Irvington was 53,926. The estimated 2017 population was 54,175, which is a 0.5 percent increase in population from 2010. Data from the 2017 U.S. Census American Community Survey estimates that 7.8 percent of the township population is five years of age or younger, and 10.8 percent is 65 years of age or older. 3.8 percent of the population is estimated to be below the poverty line. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.



Township of Irvington operates its local government with a Mayor-Council form of government under the Faulkner Act. There are seven members of the Council and an elected Mayor. Of the seven council members, four are elected as ward council members and three are elected at large.

9.10.4 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. Refers to Figure 9.10-1 and 9.10-2 at the end of this annex which illustrate the geographically-delineated hazard areas and the location of potential new development, where available.

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					
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					
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.

9.10.5 Capability Assessment

The Township of Irvington performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. 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 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 Irvington.



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 and State	Yes	No	No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Chapter 82; 1997; Periodic updates since 1977.</i>					
Zoning Code	Yes	Local and State	Yes	No	No
<i>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. Updated 6/15/04; Periodic updates since 2004.</i>					
Subdivisions	Yes	Local and State	Yes	No	No
<i>Comment: 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 174; updated 5/14/79; Periodic updates since 1979.</i>					
Stormwater Management	Yes	Local	Yes	No	No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 172; updated 2/14/07.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	No
<i>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.</i>					
Growth Management	Yes	Local	Yes	No	No
<i>Comment: State mandated at local level.</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	No
<i>Comment: Chapter 174 Section 170:40-43 (8/14/79); Periodic Updates since 8/14/79.</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	No	No
<i>Comment: Chapter 107; updated 4/10/07</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	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 #.
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	No
<i>Comment: Master Plan updated 12/09. The Master Plan includes elements for land use, relationship to neighboring plans, housing, economic plan, utility service, circulation, community facilities, recreation/open space, and historic preservation. The utility service and recreation elements discuss flooding. The economic plan discusses economic collapse and hazardous substances. Transportation failure is addressed in the circulation element.</i>					
Capital Improvement Plan	Yes	Local	Allowed	No	No
<i>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.</i>					
Disaster Debris Management Plan	No	-	No	-	-
<i>Comment:</i>					
Floodplain or Watershed Plan	Yes	Local	No	No	No
<i>Comment: Chapter 105 of the municipal code; updated 4/10/07</i>					
Stormwater Management Plan	Yes	Local and State	Yes	No	No
<i>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).</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	No	No
<i>Comment:</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	Yes	-	No	No	No
<i>Comment: Element within the Master Plan. 2002.</i>					
Shoreline Management Plan	No	-	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 #.
<i>Comment: The Township is landlocked and does not have a shoreline.</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	Yes	Local	No	Yes	-
<i>Comment: A study by a licensed forester was done several years ago to create a plan. The Department of Public Works has the plan.</i>					
Transportation Plan	Yes	Local	No	No	-
<i>Comment: A transportation plan is found within the Township's Master Plan as an element of the Master Plan.</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	Yes	Local	No	Yes	-
<i>Comment: An Office of Economic Development has been created and is in operation.</i>					
Other	Yes		Yes/No	Yes/No	Yes/No
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	No
<i>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. Plan is required by the County Office of Emergency Management and updated on a regular basis.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	-	No	-	-
<i>Comment:</i>					
Continuity of Operations Plan	In development	Local	No	-	-
<i>Comment:</i>					
Public Health Plan	Yes	Local	No	Yes	-
<i>Comment: Administered through the Health Department.</i>					
Other	No	-	-	-	-
<i>Comment:</i>					



Table 9.10-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes, Planning and Building Departments
- If no, who does? If yes, which department?	
Does your jurisdiction have the ability to track permits by hazard area?	No, but the Township is working on developing GIS capacity. Baseline maps currently exist.
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 Township has a vacant lots inventory.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Irvington.

Table 9.10-5. 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	Irvington Green Team and Environmental Commission
Open Space Board / Committee	Yes	Recreation Board
Economic Development Commission / Committee	Yes	Office of Economic Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, Swift 911
Maintenance program to reduce risk	Yes	Storm drain cleaning and tree trimming
Mutual aid agreements	Yes	For emergency services, police and fire, County and neighboring municipalities
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Engineer, Engineering Division
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer, Engineering Division
Planners or engineers with an understanding of natural hazards	Yes	Township Engineer, Engineering Division
Staff with training in benefit/cost analysis	Yes	Township Engineer, Engineering Division
Surveyors	No	-
Personnel skilled or trained in GIS applications	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM director



Staff/Personnel Resource	Available?	Department/Agency/Position
Grant writers	Yes	Various consultants
Resilience Officer	Yes	OEM Director
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Irvington.

Table 9.10-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes - Dept of Community Development
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes - Tax Assessor
User Fees for Water, Sewer, Gas or Electric Service	Yes - Tax Collector
Incur Debt through General Obligation Bonds	Yes - Municipal Council
Incur Debt through Special Tax Bonds	Yes - Municipal Council
Incur Debt through Private Activity Bonds	Yes - Municipal Council
Withhold Public Expenditures in Hazard-Prone Areas	Possible, but has not been used.
State-Sponsored Grant Programs	Yes, State demolitions funding, Road resurfacing
Development Impact Fees for Homebuyers or Developers	Township is starting to develop fees
Other	County OEM grant, New EOC funding from FEMA, added 2 emergency generators from FEMA

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of Irvington.

Table 9.10-7. 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.	No
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, the Mayor uses social media for many community announcements
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes, Environmental Commission
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.	Reverse 911 and Swift911. Swift911 in its simplest form is a system that makes phone calls to specific people or areas in the event of an emergency or for sharing important information.



COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Irvington.

Table 9.10-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	10/18/2017

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 referred to while discussing climate change adaptation; however, it also provides 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.

Table 9.10-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium
Earthquake	Low
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Low
Severe Weather	High
Winter Storm	High
Wildfire	Medium
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	High
Terrorism	Medium
Transportation Failure	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?	Department of Engineering
Who is your floodplain administrator? (name, department/position)	John A. Wiggins, P.E.; Township Engineer, Division of Engineering
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	1997
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets requirements
When was the most recent Community Assistance Visit or Community Assistance Contact?	None
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Feel adequately supported
<input type="checkbox"/> If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	No, not interested
How many flood insurance policies are in force in your jurisdiction?*	45 policies
<ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Insurance in force: \$11,722,800; Premiums in force \$106,688
How many total loss claims have been filed in your jurisdiction?*	87 total loss claims, \$488,116.06 in total payments
<ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	
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 9/30/2018

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of Irvington made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the hazard mitigation plan and strategy:

- **Housing Department:** The functions of the Housing Department are:
 - Enforce all Housing Codes; enforcement of the property maintenance codes



- Heat complaints
- Protecting the public health & safety moral and welfare, by establishing standards that govern the maintenance of appearance and or condition and occupancy of residential and non-residential properties
- **Building Department:** The Building Department enforces the New Jersey Construction Code. The Department:
 - is responsible for the administration & supervision of the Building Code
 - is designated as State Uniform Construction Code (UCC) Enforcement agency
 - is supervised by the Division manager who shall be a licensed Construction Official & township employee in classified Civil Service
- **Community Development and Planning:** The Office of Community Development and Planning performs three functions are Planning and Zoning, Redevelopment, and Property Disposition. The Irvington Office of Community Development and Planning's mission is to encourage economic growth throughout the Township by strengthening the Township's competitive position and facilitating investments that build capacity, create jobs, generate economic opportunity, grow the tax base and improve quality of life.
- **Fire Department:** It is the mission of the Irvington Fire Department to save lives and protect property by the provision of a comprehensive fire protection program designed to deliver its prevention and suppression services efficiently and effectively, and in a manner consistent with proper risk management and all duty recognized standard operating procedures.
- **Public Works:** The mission of the Department of Public Works is to design, build, operate and maintain the Township's public facilities and infrastructure in a manner that is safe, sustainable, economical and attractive. The Department of Public Works is responsible for the general management, operation and care of the infrastructure found in the Township's right-of-way including streets, alleys, parking lots, bridges, curbs, gutters, sidewalks, traffic signals, traffic signage, street striping, legend painting, curb painting, sanitary sewer system, storm drain system, reclaimed and potable water systems for irrigation, street lights, street sweeping, graffiti removal, landscapes and tree trimming, right-of-way permits and inspections; general management operation and care of Township facilities and properties including electrical, carpentry, plumbing, air conditioning & heating systems, painting, janitorial, phone system; the purchase, maintenance and repair of the Township's vehicle fleet and equipment; review of development projects for public improvements, review of tentative and final subdivision, review and approval of waste management plans. The Department of Public Works is responsible for all public works functions of municipal government, and for providing technical assistance and service to other departments. Through the Public Property and Motorized Equipment Divisions, DPW touches every other township office. Through streets and parks maintenance, the Department's responsibilities extend to every corner of the township.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The



Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

- **Sustainable Jersey:** The Township of Irvington is a bronze certified community in the Sustainable Jersey program. The township has earned points toward certification in animals in community education, green team creation, lead education and outreach programs, renewable energy, energy efficiency, energy tracking and management, and community gardens.

9.10.6 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Volume I, Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles (Section 4.3) and includes a chronology of events that have affected Essex County and its jurisdictions. The Township of Irvington’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.10-11 provides details regarding municipal-specific loss and damages the township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources. For details of these and additional events, refer to Volume I, Section 4 (Risk Assessment) of this plan.

Table 9.10-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.	Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. Although the County was impacted, the Township did not report damages.
July 17, 2019	Severe Storm, Flood	N/A	Powerful thunderstorms resulted in flash flooding throughout the region.	The Garden State Parkway was closed in both directions due to flooding.



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. Table 9.10-12 summarizes the hazards of greatest concern and risk to the Township of West Orange.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$3,446,736	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$29,273,808	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	219	NEHRP D&E:	30	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$3,990,827	
						2,500-year Loss:	\$66,871,152	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	5,928	Physical 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.		Low
		Population Below Poverty Level:	12,602					
Flood	100- and 500-Year Mean Return Period Event	100-year	263	100-year	39	100-year Loss:	\$3,547,860	High
		500-year	263	500-year	39			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	838	Class B:	120	Class B:	\$40,533,104	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Irvington.

- Number of repetitive loss (RL) properties: 12
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: The township has only held discussions thus far.

*Notes: RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).
The number of SRL properties excludes RL properties.*

CRITICAL FACILITIES

No identified critical facilities and lifelines in the community are located in the 1-percent and 0.2-percent floodplain.

Table 9.10-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure	
		1% Event	0.2% Event
None of the Township’s critical facilities are located in the floodplain.			

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Campfield Street, Drakes Lane, and Lennox Avenue are flood prone.
- An emergency generator is needed at Town Hall, possibly at Library. Would allow for command center and sheltering.
- The fire department needs an additional fire engine and fire truck, which could be used for various natural hazard response and an additional
- OEM lacks water response vehicles.
- Emergency services require an upgrade to the emergency communications system to allow for communications with neighboring municipalities and the county during disaster events.
- DPW needs tandem dump trucks for debris removal. The Township lacks the capacity.
- Parts of the stormwater system are difficult to reach and expensive to fix. Unable to handle capacity during heavy rain events. Nye Avenue and Ball Street. Lions Avenue and Claremount are areas of concern.
- Flood prone areas including 12 repetitive loss properties.
- The Township needs additional fire protection facilities.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps have been generated for the Township of Irvington 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 considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the Township of Irvington has significant exposure; Figures 9.10-1 and 9.10-2 These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as 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 Essex 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 for the Township of Irvington. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Irvington has reviewed the 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 risk ranking of extreme temperature from high to medium.
- The Township changed the risk ranking of flood from low to medium; there may be high impacts to a small area in the Township, but it equates to an overall low percentage to the community thus making it a medium ranked hazard instead of a high.
- The Township changed the risk ranking of wildfire from low to medium.
- The Township changed the risk ranking of disease outbreak from low to medium.
- The Township changed the risk ranking of hazardous substances from low to medium.
- The Township changed the risk ranking of terrorism from low to medium.
- The Township changed the risk ranking of transportation failure from low to medium.

Table 9.10-13. Township of Irvington Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Medium	Medium	Medium	High	Medium	Medium



9.10.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their 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 9.10-15. 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 #
Irvington-1: Obtain backup power for critical facilities to ensure continuity of operations. The following Irvington critical facilities have been identified to acquire generators – Fire Station 1 Fire Station 2 Fire Station 4 Chris Gatling Center Irvington Township Fire Hall	Office of Emergency Management	In Progress: 1 emergency diesel generator for police and fire 1 emergency diesel generator for Gatling Recreation Center (place of refuge) at Union Avenue	X	2020-Irvington-006
Irvington-2: Construction of an Emergency Operations Center	Township of Irvington	Complete: EOC constructed at Wagner Place Fire House		
Irvington-3: ACOE to do a study to identify corrective issues with flooding and affect repairs to concrete and masonry flumes	US ACOE	No Progress	X	2020-Irvington-007
Irvington-4: Continue to police the condition of river channels. Monitoring is performed annually which is required under the Township Storm water permit. Inspection looks for illicit discharges and structural integrity of the channel.	Township of Irvington Department of Public Works	Ongoing capability		
Irvington-5: Sanitary sewers in Columbia Ave. area – action to rehabilitate and monitor the condition of the sewer lines.	Township of Irvington Department of Public Works	-		
Irvington-6: Hazmat roadway corridors - the identification, monitoring and ability to address hazardous materials within the Township. Reduce exposure to Hazardous Materials being transported in the community	Township of Irvington Police Department	No Progress, Discontinue (Covered by state requirements and oversight)		
Irvington-7: Monitor utility substations	PSE&G	In Progress (Discontinue, PSEG responsibility. Township does coordinate and keep up to date on activity)		
Irvington-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.	Township	In Progress	X	2020-Irvington-008



The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Irvington participated in a risk assessment workshop in September 2019 where detailed information was provided on assets exposed and vulnerable to the identified hazards of concern. The Township of Irvington participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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). Refer to Section 6 and Appendix H (Mitigation Strategy Supplement) for a more complete description of the Mitigation Toolbox and its resources.

Table 9.10-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Irvington would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.10-16 provides a summary of the prioritization of all proposed mitigation initiatives for the HMP update and Table 9.10-18 summarizes the actions by type across hazards of concern.



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-Irvington-001	Expand natural floodplain of the Brook	The Brook runs through Irvington. The natural floodplain for the Brook is built out and lacks the ability absorb runoff before it enters the Brook. The channel for the Brook is narrow in areas and is prone to overflowing. This leads to properties being flooded.	The Township will identify the most flood prone properties along the Brook that would be most effective to purchase and return to natural floodplain function in order to reduce runoff into the Brook. The Township will then approach property owners and work to buyout properties . Properties	Existing	Flood, Severe Storm	1, 2	Engineering	FMA, PDM, HMGP, Private environmental grants, municipal budget	Natural floodplain function restored, water entering into Brook reduced, removal of flood properties	TBD by number of properties purchased and cost of individual properties.	5 years	Medium	SIP, NSP	PP, 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
			that are bought out will be returned to natural floodplain function.											
2020-Irvington-002	Lennox Avenue	Lenox Avenue is a flood prone area. The source of flooding cannot be mitigated in a cost-effective manner. Properties will be continually exposed to flooding over time.	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be	Existing	Flood, Severe Storm	1, 2	Engineering	FMA, PDM, HMGP, municipal budget	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	5 years	High	SIP, NSP	PP, 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
			restored to natural floodplain function to decrease runoff.											
2020-Irvington-003	Drakes Lane	Drakes Lane is a flood prone area. The source of flooding cannot be mitigated in a cost-effective manner. Properties will be continually exposed to flooding over time.	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored	Existing	Flood, Severe Storm	1, 2	Engineering	FMA, PDM, HMGP, municipal budget	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	5 years	High	SIP, NSP	PP, 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
			to natural floodplain function to decrease runoff.											
2020-Irvington-004	Lincoln Place	Lincoln Place is a flood prone area. The source of flooding cannot be mitigated in a cost-effective manner. Properties will be continually exposed to flooding over time.	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural	Existing	Flood, Severe Storm	1, 2	Engineering	FMA, PDM, HMGP, municipal budget	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	5 years	High	SIP, NSP	PP, 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
			floodplain function to decrease runoff.											
2020-Irvington-005	Campfield Street	Campfield Street is a flood prone area. The source of flooding cannot be mitigated in a cost-effective manner. Properties will be continually exposed to flooding over time.	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural floodplain	Existing	Flood, Severe Storm	1, 2	Engineering	FMA, PDM, HMGP, municipal budget	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	5 years	High	SIP, NSP	PP, 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
			function to decrease runoff.											
2020-Irvington-006	Backup Power for Town Hall/Library	The Town Hall and Library lack a backup power source. The structures are adjacent. This prevents the buildings from being properly utilized as a command center or potential shelter during severe hazard events.	The township will research and purchase the properly sized generator to handle the capacity of the Town Hall and Library. The township will then install the generator and required hookups.	Existing	Utility Interruption	6	<u>Engineering</u>	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations; provides a shelter for residents	\$50,000	1 year	High	SIP	PP
2020-Irvington-007	Study to identify corrective issues to concrete and masonry flumes	Concrete and masonry flumes are deficient and cause flooding.	USACE to do a study to identify corrective issues with flooding and affect	Existing	Flood, Severe Storm	2	<u>USACE, Engineering</u>	USACE	Reduces flooding	TBD by study	5 years	High	SIP	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
			repairs to concrete and masonry flumes											
2020-Irvington-008	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages in the Brook, Drakes Lane, Lennox Avenue, and Lincoln Place area. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims.	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	Existing	Flood	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.	\$3 million	3 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
			n and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the Brook, Drakes Lane, Lennox Avenue, and Lincoln Place area that experience frequent flooding (high risk areas).											
2020-Irvington-009	Emergency response equipment	The Township requires additional emergency response equipment.	The Township will purchase an additional fire engine and fire truck for the fire	N/A	All hazards	5	OEM	Community Facilities Grant Program, Firefighters Grant Program, municipal budget	Increases capacity of emergency administration.	\$750,000	5 years	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
			department, water response vehicles for OEM, an upgraded emergency communications system, tandem dump trucks for debris removal.											

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. Such 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. These 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. Such 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 9.10-16. 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-Irvington-001	Expand natural floodplain of the Brook	1	1	1	-1	1	-1	0	1	0	1	1	-1	1	1	6	Medium
2020-Irvington-002	Lennox Avenue	1	1	1	-1	1	-1	0	1	1	1	1	0	1	1	8	High
2020-Irvington-003	Drakes Lane	1	1	1	-1	1	-1	0	1	1	1	1	0	1	1	8	High
2020-Irvington-004	Lincoln Place	1	1	1	-1	1	-1	0	1	1	1	1	0	1	1	8	High
2020-Irvington-005	Campfield Street	1	1	1	-1	1	-1	0	1	1	1	1	0	1	1	8	High
2020-Irvington-006	Backup Power for Town Hall/Library	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Irvington-007	Study to identify corrective issues to concrete and masonry flumes	1	1	1	1	1	1	0	1	1	1	1	0	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-Irvington-008	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-Irvington-009	Emergency response equipment	1	1	0	1	1	1	0	1	1	1	1	0	1	1	11	High

Note (1): Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

Note (2): Low (0-4), Medium (5-8), High (9-14).





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 Erosion and Sea Level Rise					2020-Irvington-009			
Coastal Storm					2020-Irvington-009			
Drought					2020-Irvington-009			
Earthquake					2020-Irvington-009			
Extreme Temperature					2020-Irvington-009			
Flood		2020-Irvington-001, 2020-Irvington-002, 2020-Irvington-003, 2020-Irvington-004, 2020-Irvington-005, 2020-Irvington-008		2020-Irvington-001, 2020-Irvington-002, 2020-Irvington-003, 2020-Irvington-004, 2020-Irvington-005	2020-Irvington-009	2020-Irvington-007		
Geological Hazards					2020-Irvington-009			
Severe Weather		2020-Irvington-001, 2020-Irvington-002, 2020-Irvington-003, 2020-Irvington-004, 2020-Irvington-005		2020-Irvington-001, 2020-Irvington-002, 2020-Irvington-003, 2020-Irvington-004, 2020-Irvington-005	2020-Irvington-009	2020-Irvington-007		
Winter Storm					2020-Irvington-009			
Wildfire					2020-Irvington-009			
Civil Disorder					2020-Irvington-009			
Cyber Attack					2020-Irvington-009			



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Disease Outbreak					2020-Irvington-009			
Economic Collapse					2020-Irvington-009			
Hazardous Substances					2020-Irvington-009			
Utility Interruption		2020-Irvington-006			2020-Irvington-006, 2020-Irvington-009			
Terrorism					2020-Irvington-009			
Transportation Failure					2020-Irvington-009			

Refer to Section 6 (Mitigation Strategy) for an explanation of the mitigation categories.

9.10.9 Staff and Local Stakeholder Involvement in Annex Development

The Township of Irvington followed the planning process described in Section 2 (Planning Process) in Volume I of this plan update. 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.10-18. Contributors to the Annex

Entity	Title	Method of Participation
John F. Brown	OEM Coordinator	Primary POC, provided impact data, contributed to the mitigation strategy
Antonio Gary	Fire Chief/Deputy Coordinator	Provided impact data, contributed to the mitigation strategy, attended plan participant meetings
John Wiggins	Engineer	Provided impact data, contributed to the mitigation strategy, attended plan participant meetings
Tony Outerbridge	Police Lt.	Provided impact data, contributed to the mitigation strategy, attended plan participant meetings



Figure 9.10-1. Township of Irvington Hazard Area Extent and Location Map

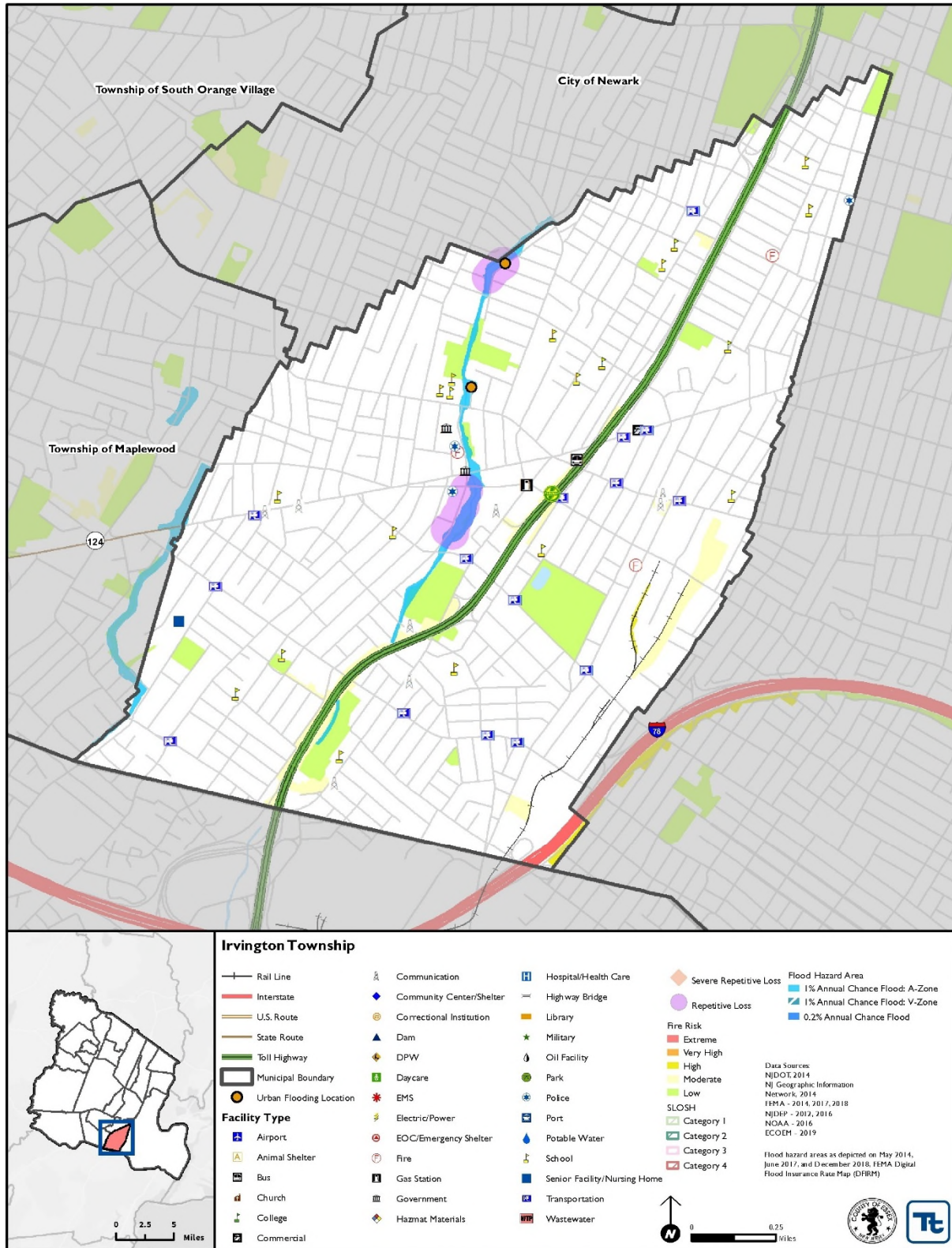
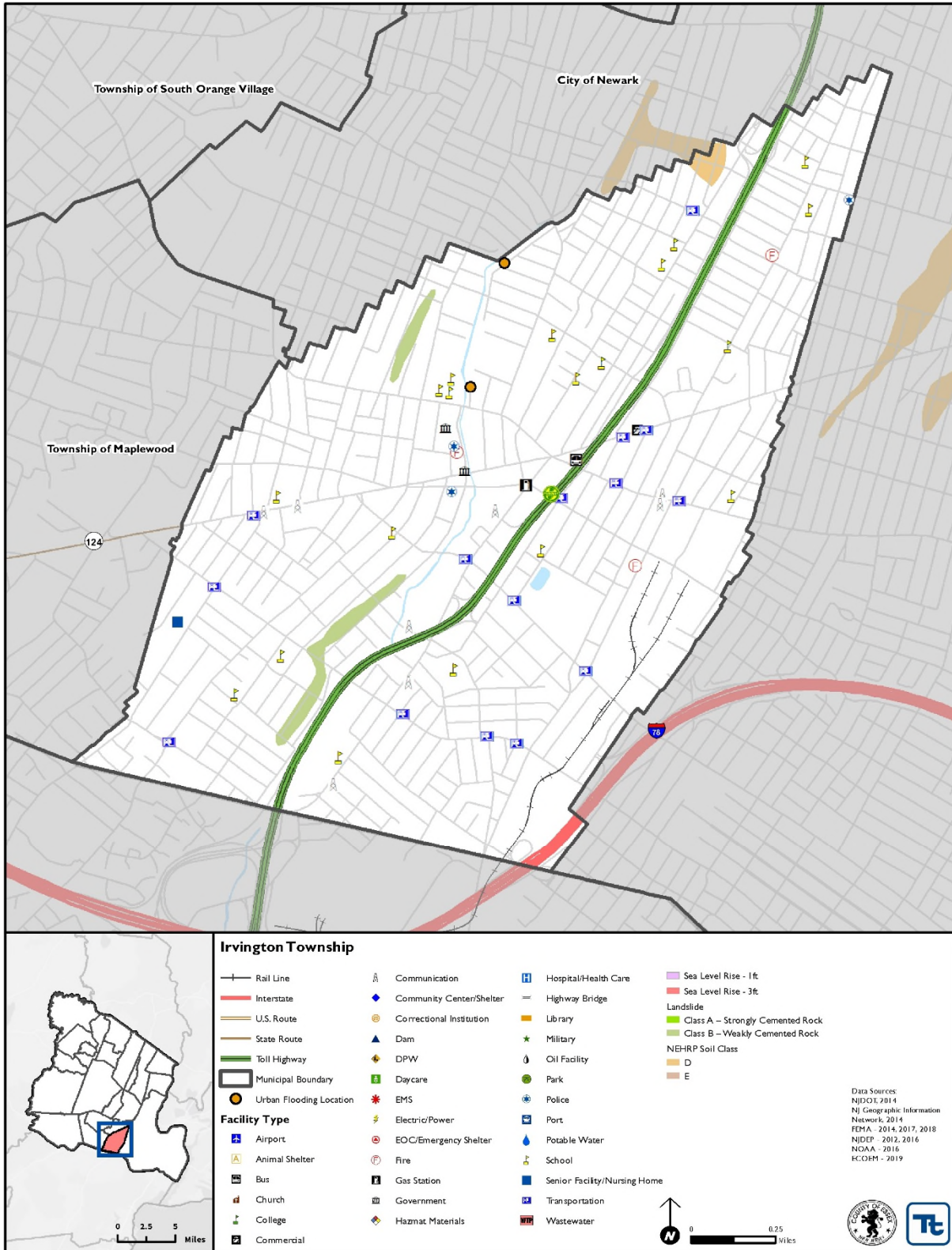




Figure 9.10-2. Township of Irvington Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Expand natural floodplain of the Brook		
Project Number:	2020-Irvington-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The Brook runs through Irvington. The natural floodplain for the Brook is built out and lacks the ability absorb runoff before it enters the Brook. The channel for the Brook is narrow in areas and is prone to overflowing. This leads to properties being flooded.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will conduct an assessment to identify the most flood prone properties along the Brook that would be most effective to purchase and return to natural floodplain function in order to reduce runoff into the Brook. The Township will then approach property owners and work to buyout properties. Properties that are bought out will be returned to natural floodplain function.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Properties removed from floodplain	Estimated Benefits (losses avoided):	Natural floodplain function restored, water entering into Brook reduced, removal of flood properties
Useful Life:	100 years	Goals Met:	1, 2
Estimated Cost:	TBD by number of properties purchased and cost of individual properties.	Mitigation Action Type:	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FMA, PDM, HMGP, Private environmental grants, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation, Open space
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Conduct outreach for property owners to reduce impervious surface	\$1,000	Impervious surface reductions likely to be limited.
	Elevate houses	\$50,000 per structure on average	Less costly than buyouts but natural floodplain function not restored
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Expand natural floodplain of the Brook	
Project Number:	2020-Irvington-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Remove residents from flood prone locations
Property Protection	1	Properties removed from flood prone locations, flood heights reduced
Cost-Effectiveness	1	
Technical	-1	
Political	1	
Legal	-1	Project requires private property owner interest and cooperation
Fiscal	0	Project requires funding support
Environmental	1	Project restores natural floodplain function
Social	0	Families removed from area
Administrative	1	
Multi-Hazard	1	Severe storm, flood
Timeline	-1	5 years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	6	
Priority (High/Med/Low)	Medium	





Action Worksheet			
Project Name:	Lenox Avenue		
Project Number:	2020-Irvington-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Lenox Avenue is a flood prone area. The source of flooding cannot be mitigated in a cost effective manner. Properties will be continually exposed to flooding over time.		
Action or Project Intended for Implementation			
Description of the Solution:	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural floodplain function to decrease runoff.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Properties elevated above 100 year flood elevation plus 1 foot of freeboard.	Estimated Benefits (losses avoided):	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased
Useful Life:	100 years for buyouts, 30 years for elevations	Goals Met:	2
Estimated Cost:	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	Mitigation Action Type:	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FMA, PDM, HMGP, municipal budget
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
	Buyout all properties	\$200,000 per property	Not all property owners likely to be interested
	Elevate all properties	\$50,000 per structure on average	Less costly than buyouts but natural floodplain function not restored
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Lenox Avenue	
Project Number:	2020-Irvington-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Remove residents from flood areas
Property Protection	1	Remove/protect property in flood areas
Cost-Effectiveness	1	
Technical	-1	
Political	1	
Legal	-1	Project requires property owners to sign on
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	0	Five years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	





Action Worksheet			
Project Name:	Drakes Lane		
Project Number:	2020-Irvington-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Drakes Lane is a flood prone area. The source of flooding cannot be mitigated in a cost effective manner. Properties will be continually exposed to flooding over time.		
Action or Project Intended for Implementation			
Description of the Solution:	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural floodplain function to decrease runoff.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Properties elevated above 100 year flood elevation plus 1 foot of freeboard.	Estimated Benefits (losses avoided):	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased
Useful Life:	100 years for buyouts, 30 years for elevations	Goals Met:	2
Estimated Cost:	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	Mitigation Action Type:	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FMA, PDM, HMGP, municipal budget
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
	Buyout all properties	\$200,000 per property	Not all property owners likely to be interested
	Elevate all properties	\$50,000 per structure on average	Less costly than buyouts but natural floodplain function not restored
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Drakes Lane	
Project Number:	2020-Irvington-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Remove residents from flood areas
Property Protection	1	Remove/protect property in flood areas
Cost-Effectiveness	1	
Technical	-1	
Political	1	
Legal	-1	Project requires property owners to sign on
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	0	Five years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	





Action Worksheet			
Project Name:	Lincoln Place		
Project Number:	2020-Irvington-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Drakes Lane is a flood prone area. The source of flooding cannot be mitigated in a cost effective manner. Properties will be continually exposed to flooding over time.		
Action or Project Intended for Implementation			
Description of the Solution:	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural floodplain function to decrease runoff.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Properties elevated above 100 year flood elevation plus 1 foot of freeboard.	Estimated Benefits (losses avoided):	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased
Useful Life:	100 years for buyouts, 30 years for elevations	Goals Met:	2
Estimated Cost:	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	Mitigation Action Type:	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FMA, PDM, HMGP, municipal budget
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
	Buyout all properties	\$200,000 per property	Not all property owners likely to be interested
	Elevate all properties	\$50,000 per structure on average	Less costly than buyouts but natural floodplain function not restored
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Lincoln Place	
Project Number:	2020-Irvington-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Remove residents from flood areas
Property Protection	1	Remove/protect property in flood areas
Cost-Effectiveness	1	
Technical	-1	
Political	1	
Legal	-1	Project requires property owners to sign on
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	0	Five years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	





Action Worksheet			
Project Name:	Campfield Street		
Project Number:	2020-Irvington-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Campfield Street is a flood prone area. The source of flooding cannot be mitigated in a cost effective manner. Properties will be continually exposed to flooding over time.		
Action or Project Intended for Implementation			
Description of the Solution:	The township will work to buyout properties that are most flood prone and elevate properties that are not interested in buyout. Elevated properties will be elevated to the base flood elevation plus 1 foot. Properties that have been bought out will be restored to natural floodplain function to decrease runoff.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Properties elevated above 100 year flood elevation plus 1 foot of freeboard.	Estimated Benefits (losses avoided):	Residential properties removed and elevated out of flooding potential, natural floodplain functions increased
Useful Life:	100 years for buyouts, 30 years for elevations	Goals Met:	2
Estimated Cost:	Cost dependent on number of interested property owners, number of elevations vs buyouts, and costs of properties.	Mitigation Action Type:	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	FMA, PDM, HMGP, municipal budget
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
	Buyout all properties	\$200,000 per property	Not all property owners likely to be interested
	Elevate all properties	\$50,000 per structure on average	Less costly than buyouts but natural floodplain function not restored
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			





Action Worksheet		
Project Name:	Campfield Street	
Project Number:	2020-Irvington-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Remove residents from flood areas
Property Protection	1	Remove/protect property in flood areas
Cost-Effectiveness	1	
Technical	-1	
Political	1	
Legal	-1	Project requires property owners to sign on
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	0	Five years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Irvington-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the Brook, Drakes Lane, Lennox Avenue, and Lincoln Place area. 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 Brook, Drakes Lane, Lennox Avenue, and Lincoln Place_area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard (<i>in accordance with flood ordinance</i>)	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:	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:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Irvington-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 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 the Brook, Drakes Lane, Lennox Avenue, and Lincoln Place areas.
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	





TOWNSHIP OF LIVINGSTON

MUNICIPALITY AT A GLANCE

Total Population: **29,955**

Total Land Area: **14.1 sq mi**

Total # Buildings: **9,795**



1% Annual Chance Flood



617

Population Residing
in Floodplain



24

Persons That
May Seek Shelter



\$23.8 Million

Potential
Building Damages



1

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$3.7 Million

Potential Building Damages

NFIP Statistics



243 # NFIP
Policies

11 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resource
Protection, Emergency Services, Structural
Projects, Climate Resilience, Community
Capacity Building

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9.11 TOWNSHIP OF LIVINGSTON

This section presents the jurisdictional annex for the Township of Livingston. The annex includes a general overview of the Township; an assessment of the Township’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 hazards.

9.11.1 Hazard Mitigation Planning Team

The following individuals are the Township of Livingston’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
Name / Title: Christopher C. Mullin / Fire Chief, Fire Official, OEM Coordinator Address: Livingston Town Hall, 375 Livingston Avenue, Livingston, NJ 07039 Phone Number: 973-992-2373 Email: cmullin@livingstonnj.org	Name / Title: Rossana Mattia / Administrative assistant to the Fire Chief Address: Livingston Town Hall, 375 Livingston Avenue, Livingston, NJ 07039 Phone Number: 973-992-2373 Email: rmattia@livingstonnj.org
NFIP Floodplain Administrator	
Name / Title: Jeannette Harduby, CFM / Township Engineer, Engineering Department Address: Livingston Town Hall, 375 Livingston Avenue, Livingston, NJ 07039 Phone Number: 973-535-7949 Email: jharduby@livingstonnj.org	

9.11.2 Jurisdiction Profile

Livingston Township is located 21.9 miles west of New York City, providing easy commuting access for residents through public transportation or personal vehicle (Township of Livingston, 2014). The land area of Livingston Township encompasses 14.08 square miles with 13.77 square miles being land and 0.31 square miles being water. To the west is Florham Park, to the south is Short Hills, to the east is South and West Orange, and to the north is Roseland.

Livingston Township is named for the first Governor of New Jersey, William Livingston, who had an integral role in the formation of the United States Constitution. Seven Hamlets, Teedtown, Northfield, Morehousetown, Cheapside, Washington Place, and Squiretown, resided in the area prior to coming together to create Livingston Township (Township of Livingston, 2014). The Council-Manager form of government was started in Livingston Township in 1957. The Town Council consists of five Livingston residents. From the members of the town council, the Mayor is chosen (Township of Livingston, 2014).

According to the U.S. Census, the 2010 population for the Township of Livingston was 29,366. The estimated 2017 population was 29,955, a 2.0 percent decrease from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.6 percent of the population is 5 years of age or younger and 18.6 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.





9.11.3 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. Figure 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, where available.

Table 9.11-2. 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	31	42	23	Unknown	Unknown
Multi-Family	120	344	0	Unknown	Unknown
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					
New multi-family building	Residential	1 building/ 12 units	660 S. Orange Avenue	None	Completed
Post Acute Care Facility	Medical	1 building	348 E. Cedar Street	None	74 beds - Completed
Assisted Living Facility	Senior	1 building/ 124 units	346 E. Cedar Street	None	Under construction
Squiretown	Residential	5 buildings/ 220 units	Briggs Circle	None	Completed
Brandywine Senior Living	Senior	1 building/ 120 units	369 E. Mt. Pleasant Ave	None	Completed
Hillside-Northfield Partners	Residential	4 buildings/ 80 units	Murray Court	None	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Sunrise Development	Assisted Living/Senior Living	105	Block 6300, Lot 30	None	Planning Board
A&M Properties	Multi-Family Housing	120	Block 107, Lot 8.01	None	Conceptual Development
Coddington Community None Conceptual Development	Family Housing	56	Block 6101, Lot 25, 26, 27, 28	None	Conceptual Development
Livingston Corporate Park	Townhomes	162	Block 6101, Lot 45	None	Conceptual Development
Mt. Pleasant Senior Development	Assisted Living/Senior Living	250-260	Block 2100, Lot 39.02, 41	None	Conceptual Development
Golan Development	Apartments	13	Block 2700, Lot 52	None	Conceptual Development
Mungiello/Bruno Project	Multi—Family Housing	26	Block 2700, Lot 9, 62	None	Conceptual Development

* Only location-specific hazard zones or vulnerabilities identified.



9.11.4 Capability Assessment

The Township of Livingston 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 Livingston.

Table 9.11-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Township of Livingston	Building Department	State	Yes	No	No
<i>Comment: Uniform Construction Codes, Chapter 110, 2010. 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.</i>							
Zoning Code	Yes	Township of Livingston	Planning, Building & Zoning	No	Yes	Yes	N/A
<i>Comment: Land Use, Chapter 170, Adopted 2004. Updated regularly. The Planning and Zoning Board review reviews development applications to ensure growth is out of the floodplain. Lot surface drainage if increasing impervious coverage to restrict downstream impacts through BMPs.</i>							
Subdivisions	Yes	Township of Livingston	Planning, Building & Zoning	No	Yes	No	No
<i>Comment: Land Use, Chapter 170, Article IX, Subdivision Review, Site Plan Review and Site Improvements. The Livingston Building Inspector inspects all permits. 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.</i>							
Stormwater Management	Yes	Township of Livingston	Engineering	NJDEP	Yes	No	No
<i>Comment: Land Use, Chapter 170, Article XIII, Stormwater Management Plans.</i>							
Post-Disaster Recovery	No	-	-	-	No	-	-



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
<i>Comment:</i>							
Real Estate Disclosure	No	-	-	-	No	-	-
<i>Comment:</i>							
Growth Management	Yes	Township of Livingston	Planning, Building & Zoning	No	Yes	Yes	N/A
<i>Comment: See Zoning Ordinance.</i>							
Shoreline Development	No	-	-	-	No	-	-
<i>Comment:</i>							
Site Plan Review	Yes	Township of Livingston	Planning, Building & Zoning	No	Yes	Yes	N/A
<p><i>Comment: Land Use, Chapter 170, Article IX, Subdivision Review, Site Plan Review and Site Improvements. Upon receipt of an application, the Planning Director shall forward the same to either the Planning Board or Board of Adjustment, depending upon who has jurisdiction. If the Planning Board has jurisdiction, the Planning Director shall forward a copy to each of the following for report and recommendation:</i></p> <p><i>(1) The Township Engineer. (2) The Environmental Commission, when an environmental impact statement is required. (3) Such other Township, county, state and federal officials and agencies as determined by the Planning Director.</i></p>							
Environmental Protection	No	-	-	-	No	-	-
<i>Comment:</i>							
Flood Damage Prevention	Yes	Township of Livingston	Engineering	No	No	No	No
<p><i>Comment: Land Use, Chapter 170, Article X Flood Hazard Areas, [Amended by Ord. No. 22-19939; Ord. No. 8-2001; Ord. No. 22-2001; 4-9-2007 by Ord. No. 9-2007]. The Legislature of the State of New Jersey has in N.J.S.A. 40:48-1 et seq., delegated the responsibility to local governmental units to adopt regulations designed to promote public health, safety and general welfare of its citizenry.</i></p>							
Wellhead Protection	No	-	-	-	No	-	-
<i>Comment:</i>							
Emergency Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Reconstruction Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Other: Open Space	Yes	Township of Livingston	Planning & Engineering	No	No	No	No
<p><i>Comment: Land Use, Chapter 170, Article XX, Open Space. [Added 9-18-2006 by Ord. No. 37-2006]. Restricts development in open space districts.</i></p>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Other: Steep Slopes	Yes	Township of Livingston	Planning & Engineering	No	No	No	No
<i>Comment: Land Use, Chapter 170, Article XXIV, Steep Slopes, Added 9-8-2009 by Ord. No. 24-2009. Area 1: 0-14.9% unregulated, Area 2: 15-24.9% precautionary, Area 3: 25% or greater prohibitory and integrated in the 2018 Stormwater Management Plan. The purpose of this ordinance is to regulate the intensity of use in areas of steeply sloping terrain in order to limit soil loss, erosion, excessive stormwater runoff, the degradation of surface water and to maintain the natural topography and drainage patterns of land.</i>							
Other: Riparian Zones	Yes	Township of Livingston	Planning & Engineering	No	No	No	No
<i>Comment: Land Use, Chapter 170, Article XXV, Riparian Zones, Added 4-11-2011 by Ord. No. 8-2011</i>							
Other: Property Easement/Sump Pump Ordinance, Sidewalk Permit, Lot Surface Drainage Permit, Road Opening Permit, Soil Removal Permit, Tree Removal Permit	Yes	Township of Livingston	Planning & Engineering	No	No	No	No
<i>Comment: Required as part of Chapter 170. Ordinance 33-2011. Referenced on website https://www.livingstonnj.org/508/Permitting</i>							
Planning Documents							
Master Plan	Y	Township of Livingston	Planning	No	Yes	No	Yes
<i>Comment: Livingston Master Plan (Adopted April 2018). The plan has a section Compatibility with "Plans other than Township Plan" that could add a section that indicates compatibility with the County Hazard Mitigation Plan.</i>							
Capital Improvement Plan	Yes	Township of Livingston	CFO	No	No	No	No
<i>Comment: Updated annually by the CFO.</i>							
Disaster Debris Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Floodplain or Watershed Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Stormwater Management Plan	Yes	Township of Livingston	Engineering	State	Yes	No	No
<i>Comment: Provided in the Master Plan Section XIII - Stormwater Management Plan. An updated version provided on township's engineering website https://www.livingstonnj.org/1149/Stormwater-Management. Updated 2019 with 2018 Tier A permit, Steep Slopes Ordinance, and maps.</i>							
Stormwater Pollution Prevention Plan	Yes	Township of Livingston	Engineering	State	Yes	No	No
<i>Comment: Draft December 18, 2018 from township's engineering website https://www.livingstonnj.org/1149/Stormwater-Management.</i>							
Urban Water Management Plan	No	-	-	-	-	-	-
<i>Comment:</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	No	-	-	-	-	-	-
<i>Comment:</i>							
Economic Development Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Shoreline Management Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Community Wildfire Protection Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Community Forestry Management Plan	Yes	Township of Livingston	Public works	No	No	No	No
<i>Comment: Plan not available electronically.</i>							
Transportation Plan	Yes	Township of Livingston	DPW, Engineering	No	No	No	No
<i>Comment: Master plan has Section V Circulation Plan.</i>							
Agriculture Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Business Development Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Other: Open Space Plan	Yes	Township of Livingston	Engineering	No	No	No	No
<i>Comment: Master plan has Section VIII - Recreation & Parks Plan.</i>							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of Livingston	Local Emergency Management Coordinator	County, State	Yes	No	No
<i>Comment: Copy at the fire station</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-	-	-
<i>Comment:</i>							
Post-Disaster Recovery Plan	No	-	-	-	-	-	-



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
<i>Comment:</i>							
Continuity of Operations Plan	Yes	Township of Livingston	Local Emergency Management Coordinator, Police, Health Officer, DPW	No	No	No	No
<i>Comment: Element of the CEMP</i>							
Public Health Plan	Yes	Township of Livingston	Health Officer	No	No	No	No
<i>Comment: Annex of CEMP.</i>							
Other: Website information	Yes	Township of Livingston	Local Emergency Management Coordinator, Police, Health Officer, DPW	County, State	No	No	No
<i>Comment: Website available at https://www.livingstonnj.org/212/Emergency-Management</i>							

Table 9.11-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Building
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.	Yes Town is fully built out; inventory as part of COAH obligation

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Livingston.

Table 9.11-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning and Engineering
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes	Open Space Trust Committee



Staff/Personnel Resource	Available?	Department/Agency/Position
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	SwiftReach
Maintenance program to reduce risk	Yes	DPW tree trimming, storm drain clearing
Mutual aid agreements	Yes	Fire - Formalized county aid, State e team
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, Building
Planners or engineers with an understanding of natural hazards	Yes	Planning and Engineering
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Engineering
Staff with education/knowledge/training in low impact development	Yes	Engineering
Surveyors	No	-
Personnel skilled or trained in GIS applications	Yes	Planning and Engineering
Stormwater Engineer	Yes	Engineering
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Watershed Planner	No	
Environmental Specialist	No	
Grant writers	Yes	All department heads submit grant applications
Resilience Officer	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Livingston.

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	No
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	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 Township of Livingston.

Table 9.11-7. 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?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Swift reach and specific website
Do you use social media for hazard mitigation education and outreach?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Facebook, twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Environmental Commission
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Swiftreach
Do you have any established warning systems for hazard events?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Swiftreach, TV 34

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Livingston.

Table 9.11-8. 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	4/1/1997
Storm Ready Certification	No	-	-
Firewise Community Classification	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.



The municipality have access to resources to determine the possible impacts of climate change upon the municipality. The administration is supportive of integrating climate change in policies or actions. Climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality.

Table 9.11-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Storms	Medium
Dam Failure	Low
Drought	High
Earthquake	Low
Extreme Temperature	High
Flood	Medium
Geological Hazards	Medium
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	High
Civil Disorder	High
Cyber Attack	Medium
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	High
Terrorism	Medium
Transportation Failure	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 9.11-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering Department
Who is your floodplain administrator? (department/position)	Township Engineer, Engineering Department
Are any certified floodplain managers on staff in your jurisdiction?	Yes. Township Engineer
What is the date that your flood damage prevention ordinance was last amended?	2007
Does your floodplain management program meet or exceed minimum requirements?	Meets
· If exceeds, in what ways?	N/A
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 10/15/1993, CAV: 06/29/1993
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
· If so, state what they are.	N/A



Criterion	Response
Are any RiskMAP projects currently underway in your jurisdiction?	Yes
· If so, state what they are.	N/A
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	No
· If no, state why.	N/A
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?	N/A
Does your jurisdiction participate in the Community Rating System (CRS)?	No
· If yes, is your jurisdiction interested in improving its CRS Classification?	N/A
· If no, is your jurisdiction interested in joining the CRS program?	Yes
How many flood insurance policies are in force in your jurisdiction?*	243
· What is the insurance in force?	\$80,605,400
· What is the premium in force?	\$307,341
How many total loss claims have been filed in your jurisdiction?*	243
· How many claims are still open or were closed without payment?	83
· What were the total payments for losses?	\$1,217,213.20
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

*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.

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of Livingston made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- The Township enacted the following ordinances and permit programs to limit stormwater quantities and protect water quality:
 - Riparian Zone Ordinance
 - Steep Slopes Ordinance
 - Open Space Ordinance
 - Property Easement/Sump Pump Ordinance
 - Sidewalk Permit
 - Lot Surface Drainage Permit
 - Road Opening Permit
 - Soil Removal Permit

- The Township of Livingston participated in the Sustainable Jersey program and achieved Silver certification in November 2013 with 365 points.

9.11.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Livingston’s history of





federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.11-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.11-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard DR-4264	Yes	<p>Low pressure moving across the deep South on January 21 and January 22 intensified and moved off the Mid Atlantic coast on January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.</p> <p>At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.</p>	The township reported unspecified damages.
7/14/16	Thunderstorm Wind	No	<p>A line of strong to severe storms moved across Northeast New Jersey. A large tree snapped and landed on a car on Maple Street just east of West Orange. \$7.5K in property damages were reported. A large tree snapped and fell on a fence between West Orange and Glen Ridge. \$2K in property damages were reported. A tree fell on a car along Branch Brook Drive just west of Belleville. \$6K in property damages were reported.</p>	The township did not report any damages for this event.
3/14/17	Winter Storm	No	<p>Rapidly deepening low pressure tracked up the eastern seaboard on March 14, bringing 8 to 13 inches of heavy snow and sleet, along with strong winds across Northeast New Jersey.</p>	The township did not report any damages for this event.
1/4/18	Winter Storm	No	<p>The low pressure rapidly intensified through January 4, as it moved north-northeast along the coast. The rapid intensification of the storm led to heavy snow, strong winds, and near-blizzard conditions across northeast New Jersey, with 8.4 inches of snow and winds gusts of 44 MPH reported at Newark Liberty Airport.</p>	The township did not report any damages for this event.
3/7/18	Winter Storm	No	<p>A strong low-pressure system tracked along the coast through late March 7 and early morning on March 8 bringing heavy wet snow, strong</p>	The township did not report any damages for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			gusty winds, and thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times, resulting in 1 to 2 feet, which brought down trees and some power lines.	
11/15/18	Winter Storm	No	A wave of low pressure developed along the Middle Atlantic coast November 15. The heavy, wet snow significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, causing many power outages. Newark Airport reported 6.4 inches of snow.	The township did not report any damages for this event.
1/30/19	Strong Wind	No	Strong winds occurred behind low pressure and cold front, with 30 mph sustained winds measured at Caldwell Airport.	The township did not report any damages for this event.
3/15/19	Thunderstorm Wind, Hail	No	A cold front moved through the region triggering strong to severe thunderstorms across northeast New Jersey.	The township did not report any damages for 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. The following summarizes the hazards of greatest concern and risk to the Township of Livingston.

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), the Livingston area is subject to frequent rainfalls of great intensity and varying origin. The rainfall may be from local thunderstorms, hurricanes, storms originating over the Atlantic Ocean, or storms coming from the mainland. High intensity, short duration storms tend to cause flooding of the smaller drainage basins of the Township. Lower intensity, longer duration storms are more troublesome to the waterways with larger tributary areas, such as Canoe Brook and the Passaic River (FEMA FIS 2014).

The Township of Livingston is highly developed with buildings and paved areas covering a significant portion of the land area and effectively reducing the amount of land available to absorb precipitation. Throughout most of the Township, the surface soil has a relatively low permeability, although there are a few local deposits of sand and gravel. In general, the slope of the terrain varies from one percent to ten percent throughout most of the Township. The low permeability of the soil, the steep slope of the terrain, and the high degree of development in Livingston all contribute to relatively high amounts of runoff, especially from the high intensity storms experienced on the east coast of the United States. The runoff is carried in open waterways to the Passaic River. The present problems due to storm water runoff are principally related to high velocity flow, channel erosion (particularly in upstream areas), and subsequent depositions of rock and silt in the downstream portions of the brooks (FEMA FIS 2014).



Local flooding in Livingston is generally due to inadequate storm sewers, high-water elevations in the streams to which the storm sewers discharge, or blockages, such as silting of the stream channel at the point of discharge from a storm sewer. In addition to causing silting and blockage of the stream channel, the erosion caused by the high velocities also undermines the embankments of the streams and affects the adjacent land area. This type of damage is caused not only by severe floods but also by the cumulative effects of lesser, but more frequent storms (FEMA FIS 2014).

The downstream portions of Canoe Brook and Slough Brook, as well as the land area bordering the Passaic River, are greatly influenced by high water levels in the Passaic River. A historic flood in Livingston in the Passaic River Basin occurred during October 1903; however, because of the low level of development at that time, damages were not too severe. The storm of October 1903 was centered over Paterson, where a total of 15.5 inches of rainfall was recorded (FEMA FIS 2014).

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Table 9.11-12 summarizes the risk assessment results used for the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Livingston.

- Number of repetitive loss (RL) properties: 9
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 1

Note: RL and SRL as of 03/31/2019



Table 9.11-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$3,683,983	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$25,466,370	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	1,022	NEHRP D&E:	310	100-year Loss:	\$0	High
		Liquefaction Class 4:	40	Liquefaction Class 4:	12	500-year Loss:	\$5,568,549	
						2,500-year Loss:	\$92,818,762	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	5,579	Physical 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.		Low
		Population Below Poverty Level:	698					
Flood	100- and 500-Year Mean Return Period Event	100-year	617	100-year	206	100-year Loss:	\$23,847,476	High
		500-year	669	500-year	223			
Geological	High Landslide Susceptibility Areas	Class A:	12	Class A:	4	Class A:	\$2,322,170	Moderate
		Class B:	25	Class B:	9	Class B:	\$7,155,578	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	6	Wildfire:	2	Wildfire:	\$2,526,898	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	<p>Port Newark is in Essex County (3rd largest port in the U.S.)</p> <p>Major highways/rail</p> <p>Pipelines</p> <p>10 NPL Sites in County</p>	<p>Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.</p>	<p>The degree of damages to a building depends on the scale of the incident.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Utility Interruption	<p>Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.</p>	<p>The degree of impact to the population depends on the scale of the incident.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Terrorism	<p>Terrorist Attack</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Transportation Failure	<p>One accident on any of the following: Roadway/vehicular, Aviation, Rail</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>Low</p>



CRITICAL FACILITIES

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplains.

Table 9.11-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Atlantic Ambulance Corporation*	EMS	X	X	2020-LIVINGSTON -010
Livingston Township Sewage Treatment Plant*	Wastewater Treatment Plant	-	X	2020-LIVINGSTON -011

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

Additionally, the municipality has identified the following hazard problems and/or problem areas during floods and severe storms:

- Dorsa Avenue/Navlon Avenue/Navlon Place – Substantial flooding occurs during major rain events in which the Passaic River overflows its banks and floods the industrial area. This area is generally closed, and the buildings are not accessible by vehicles. This flooding, and the fact that these buildings are not accessible by fire apparatus, increase the possibility of a substantial large-scale fire loss in the industrial section of the Township.
- 235 South Livingston Avenue (Town Garage) – During periods of heavy rain, water from the brook behind the garage overfills its banks and comes into the garage, causing a hazard for equipment and personnel. The Township has lost vehicles and equipment. In an emergency, DPW is sometimes ineffective because they are dealing with an emergency in their own facility.
- Broadlawn Place – During a one inch or greater rain event, the roadway floods to impassable levels because Canoe Brook has a drainage problem in this area. During substantial periods of rain, people from adjoining houses have had to evacuate.
- Royal Avenue – During substantial rain, Royal Avenue floods, making it impassable to traffic and the road has to be closed until the water recedes.
- Falcon Road – During major storm events, Falcon Road between the path and West Oakwood Avenue becomes impassable to traffic.
- Route 10 East/West – In front of Pizzeta, during heavy rains (one inch or greater), it becomes impassable.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Livingston 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 Livingston has significant exposure; Figure 9.11-1 and Figure 9.11-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Township of Livingston. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Livingston has reviewed the Essex 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 calculated hazard ranking, the Township indicated the following:

- The Township changed the hazard ranking for flood from low to high due to the prevalence of flooding in many locations along brooks that feed the Passaic River.
- The Township changed the hazard ranking for wildfire from low to medium due to extreme weather due to climate change predictions.
- The Township changed the hazard ranking for cyber-attack from low to medium due to increasing threats of cyber-attacks experienced by municipalities, schools, and private industry.
- The Township changed the hazard ranking for economic collapse from medium to low due to the current economy.
- The Township changed the hazard ranking for hazardous substances from low to medium due to increased hazards from spills and releases.
- The Township changed the hazard ranking for terrorism from low to medium due increased terrorism events.

Table 9.11-14. Township of Livingston Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	High
Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium



Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Medium	High	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 9.11-15. 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 #
Livingston-1 Provide emergency backup power at critical facility locations to ensure utilities can function during power outages. Facilities identified at this time: 1. Livingston Senior Center 2. Livingston North Hillside water booster station	Township OEM	Complete	No. Emergency Services (ES) received grant for \$222,000 for 2 backup generators from mitigation grant.	-
Livingston-2 Conduct stream cleaning and restoration to reduce flooding and streambank erosion that is impacting property of private residents. Locations include Canoe Brook, Cub Brook and Slough Brook; within the limits of Livingston and the private properties that adjoin them.	Township Engineering	No development	Yes	2020-LIVINGSTON-001
Livingston-3 Relocate DPW garage which repetitively floods causing loss of function and property and vehicle damage.	Township Engineering	In progress	Yes	2020-LIVINGSTON-002
Livingston-4 Evaluate all new development to reduce stormwater runoff with every plan review. Complete a town-wide drainage study that evaluates capacity of all systems to handle today’s runoff. This study and plan will identify all localized flooding outside of FEMA designated zones and devise mitigation options to eliminate these hazards.	Township Engineering	In progress.	Yes	2020-LIVINGSTON-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 #
Livingston-5 Develop and implement an easement and culvert cleaning plan	Township	In progress	Yes	2020-LIVINGSTON-004
Livingston-6 Restore old drainage ways to their original capacity	Township	No progress	Yes	2020-LIVINGSTON-005
Livingston-7 Develop and implement a post-event damage assessment program, including the following elements: <ul style="list-style-type: none"> • Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. • Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. • Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Town/Village (e.g. building permit process). 	Township Engineering, FPA	No progress	Yes	2020-LIVINGSTON-006
Livingston-8 Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.	FPA	No progress	No	-
Livingston-9 Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).	FPA	No progress	No	-
Livingston-10 Have designated NFIP Floodplain Administrator (FPA), and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).	FPA	Complete	No. Municipal Engineer is a CFM	-



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 #
Livingston-11 Enhance/expand tree maintenance program and coordination with utilities (e.g., PSEG).	Township Engineering	In progress	No. PSEG performs maintenance.	-
Livingston-12 Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Township	In progress	Yes	2020-LIVINGSTON-007
Livingston-13 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.	Township, FPA	No progress	No. Not a priority.	-

In addition to the above progress, the Township of Livingston identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- Drainage improvements to Hillside Terrace, Zahn Terrace, Charles Street, Grand Terrace – During periods of major storms, this entire area was impassable to traffic and required the roads to be closed. The Township of Livingston made drainage improvements to resolve the flooding.
- Bryant Drive/Madison Court – During major events, these two adjoining roads become dangerous to vehicle traffic and need to be closed down. The Township of Livingston made drainage improvements to resolve the flooding.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Livingston participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Livingston participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (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 Township of Livingston 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.11-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.11-18 summarizes the actions by type across hazards of concern.



Table 9.11-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020-LIVINGS TON-001	Conduct stream cleaning and restoration.	Flooding and streambank erosion is impacting property of private residents. Locations include Canoe Brook, Cub Brook and Slough Brook; within the limits of Livingston and the private properties that adjoin them.	Existing	Flood, Winter Storm, Severe Storm	1.2, 2.3	Township Engineering	Municipal Budget	High	Low	Short	High	NSP	PR, NR
		Develop plan for stream cleaning and restoration in Canoe Brook, Cub Brook and Slough Brook.											
2020-LIVINGS TON-002	Relocate DPW garage.	DPW garage repetitively floods causing loss of function and property and vehicle damage.	Existing	Flood, Winter Storm, Severe Storm	1.2, 2.2, 6.1	Township Engineering	Municipal Budget	High	High	Medium	High	SIP	PR, PP
		Relocate DPW garage.											
2020-LIVINGS TON-003	Evaluate all new development to reduce stormwater runoff with every plan review.	Stormwater runoff from development causes flooding.	Existing	Flood, Winter Storm, Severe Storm	1.2, 1.3, 2.3	Township Engineering	Municipal Budget	Medium	High	Medium	High	LPR, NSP	PR, PP, PI
		Complete a town-wide drainage study that evaluates capacity of all systems to handle current runoff. This study and plan will identify all localized flooding outside of FEMA designated zones, including 9 RL properties, and devise mitigation options to eliminate these hazards.											
2020-LIVINGS TON-004	Easement and culvert cleaning plan	Culverts become clogged with debris and cannot discharge stormwater effectively.	Existing	Flood, Winter Storm, Severe Storm	1.2, 1.3, 2.3	Township Engineering, DPW	Municipal Budget	Medium	High	Medium	High	LPR, NSP	PR, PP
		Develop and implement an easement and culvert cleaning plan											
2020-LIVINGS TON-005	Restore old drainage ways to their original capacity	Culverts become clogged with debris and cannot discharge stormwater effectively.	New	Flood, Winter Storm, Severe Storm	1.2, 2.2	Township Engineering	HMGP, PDM, Municipal Budget	High	Medium	Medium	Medium	SIP	PR, PP
		Restore old drainage ways to their original capacity.											



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020-LIVINGS TON-006	Post-event damage assessment program.	The process for recording damages after a storm is not well defined.	Existing	Flood, Winter Storm, Severe Storm	1.2, 1.3, 2.3	Township Engineering, FPA	Municipal Budget	Medium	High	Medium	High	LPR, NSP	PR, PP
		Implement a post-event damage assessment program, including the following: <ul style="list-style-type: none"> • Conduct public outreach to inform property owners of the need to report property damage and obtain required permitting when making repairs. • Organize local resources to conduct post-event damage assessments, including substantial damage determination. • Develop an inventory (file system and/or database) of losses (i.e., loss of service, property damage, economic losses) 											
2020-LIVINGS TON-007	Mutual Aid agreements with neighboring communities for continuity of operations	During some events, additional resources might be needed.	Existing	All	5.3, 6.2	Township OEM	Municipal Budget	High	Low	High	High	LPR	PR
		Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations.											
2020-LIVINGS TON -008	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP.	New	All	4.1, 5.4	Planning Board	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, PI
		Include discussion of Essex County HMP in next update.											
2020-LIVINGS TON -009	Riker Hill Art Park Hydrants	Riker Hill Park needs additional fire hydrants for firefighting.	New	Fire	1.2, 6.1	Township OEM	Municipal Budget	High	High	Medium	High	SIP	PR, PP
		Extend the water main to Riker Hill Park to provide proper fire protection to buildings.											



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020-LIVINGS TON -010	Atlantic Ambulance Corporation	The ambulance company that is used for St. Barnabas Hospital is in the floodplain..	New	Flood, Winter Storm, Severe Storm	1.2, 2.3	Township Engineering, FPA	Municipal Budget	Medium	Low	Medium	Medium	EAP	PR, PP
		Discuss with the owner to recommend for them to develop a plan.											
2020-LIVINGS TON -011	Livingston Township Sewage Treatment Plant	The Township's wastewater treatment facility is in the floodplain.	New	Flood, Winter Storm, Severe Storm	1.2, 2.3	Township Engineering, FPA	Municipal Budget	Medium	Medium	Medium	Medium	EAP, SIP	PR, PP
		Determine vulnerabilities and develop mitigation strategies, if necessary.											
2020-LIVINGS TON -012	Repetitive Loss (RL) property outreach and mitigation	There are flood-prone properties in the Township of which some are categorized as repetitive loss properties under the NFIP. The Township currently does not maintain a list of properties that have been damaged by flooding or property owners interested in mitigation.	New	Flood, Winter Storm, Severe Storm	1.2, 1.3, 2.3	FPA	Municipal Budget	Medium	Medium	Medium	Medium	EAP, SIP	PR, PI
		Track flood-prone properties, and conduct outreach to educate owners of their RL status and mitigation options. The Township will compile a list of mitigation activities the homeowners would like to pursue then develop a FEMA HMA grant to obtain funding.											

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

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.





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 9.11-17. 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-LIVINGSTON-001	Conduct stream cleaning and restoration.	1	1	1	1	0	1	1	1	1	1	0	1	1	0	11	High
2020-LIVINGSTON-002	Relocate DPW garage.	1	1	1	1	1	1	0	1	1	1	0	1	1	1	12	High
2020-LIVINGSTON-003	Evaluate all new development to reduce stormwater runoff with every plan review.	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-LIVINGSTON-004	Easement and culvert cleaning plan	1	1	1	1	1	1	1	1	1	1	0	1	1	0	12	High
2020-LIVINGSTON-005	Restore old drainage ways to their original capacity	1	1	0	1	0	0	1	1	1	0	0	0	1	1	8	Medium
2020-LIVINGSTON-006	Post-event damage assessment program.	0	1	1	1	1	1	1	1	1	0	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-LIVINGSTON-007	Mutual Aid agreements with neighboring communities for continuity of operations	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-LIVINGSTON-008	Master Plan and HMP Integration	0	1	1	1	0	1	1	0	0	0	1	0	0	0	6	Medium
2020-LIVINGSTON-009	Riker Hill Art Park Hydrants	1	1	1	1	1	1	1	0	1	1	0	0	1	0	10	High
2020-LIVINGSTON-010	Atlantic Ambulance Corporation	1	0	0	1	0	0	1	0	1	0	1	0	0	0	5	Medium
2020-LIVINGSTON-011	Livingston Township Sewage Treatment Plant	1	1	1	1	0	1	0	0	1	0	0	0	0	0	6	Medium
2020-LIVINGSTON-012	RL property outreach	1	1	1	1	0	1	1	0	1	0	1	0	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 9.11-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion / Sea Level Rise					2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011			
Coastal Storm					2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012			2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 01
Drought					2020-LIVINGSTO N- 002, 003, 006, 007, 008, 009			
Earthquake					2020-LIVINGSTO N-002, 006, 007, 008, 010			
Extreme Temperature					2020-LIVINGSTO N-002, 006, 007, 008, 009, 010			2020-LIVINGSTO N-002, 006, 007, 008, 009, 010
Flood	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012
Geological hazards					2020-LIVINGSTO N-002, 006, 007, 008, 010			2020-LIVINGSTO N-002, 006, 007, 008, 010
Severe Weather	-	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012
Severe Winter Weather	-	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012	2020-LIVINGSTO N-001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 012
Wildfire	-	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009	2020-LIVINGSTO N-009
Civil Disorder					2020-LIVINGSTO N-002, 006, 007, 008, 010			



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Cyber Attack					2020-LIVINGSTO N-007, 008			
Disease Outbreak	2020-LIVINGSTO N-010		2020-LIVINGSTO N-010		2020-LIVINGSTO N-002, 007, 008			
Economic Collapse (new)					2020-LIVINGSTO N-007, 008			
Hazardous Substances					2020-LIVINGSTO N-002, 006, 007, 008, 010			x
Utility Interruption					2020-LIVINGSTO N-002, 006, 007, 008, 010			x
Terrorism					2020-LIVINGSTO N-007, 008			
Transportation Failure					2020-LIVINGSTO N-002, 006, 007, 008, 010			x

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 Township of Livingston 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.11-19. Contributors to the Annex

Entity	Title	Method of Participation
Christopher Mullen	Fire Chief/OEM Coordinator	Primary POC, attended first and second meeting, reviewed notes, provided data, coordinated response
Jeannette Harduby, CFM	Township Engineer	Attended first and second meeting, reviewed notes, provided data
Glenn Turtletaub	Township Clerk	Attended first meeting, reviewed notes.
Michael Caetano	Building Subcode	Attended first meeting, reviewed notes, provided data



Figure 9.11-1. Township of Livingston Hazard Area Extent and Location Map

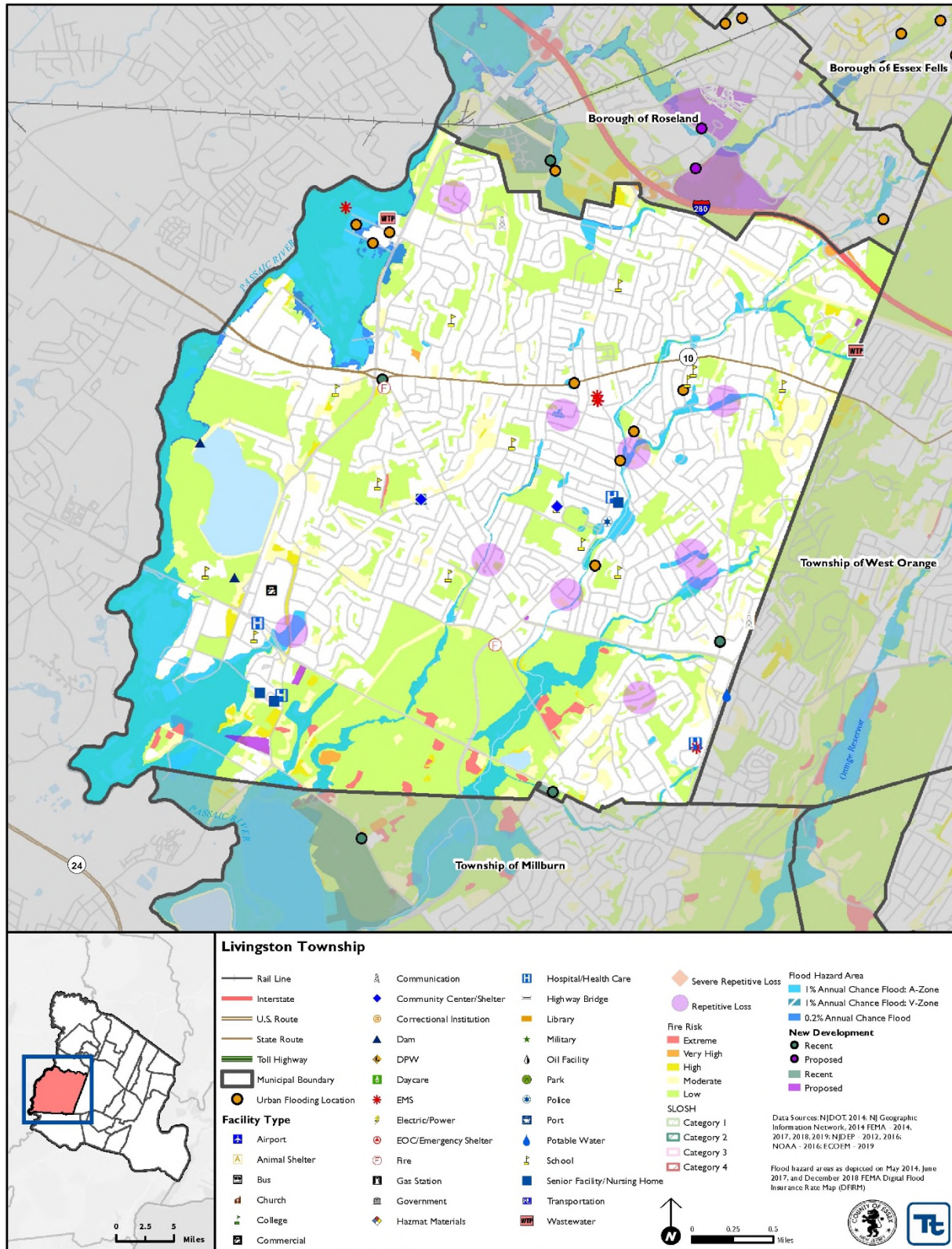
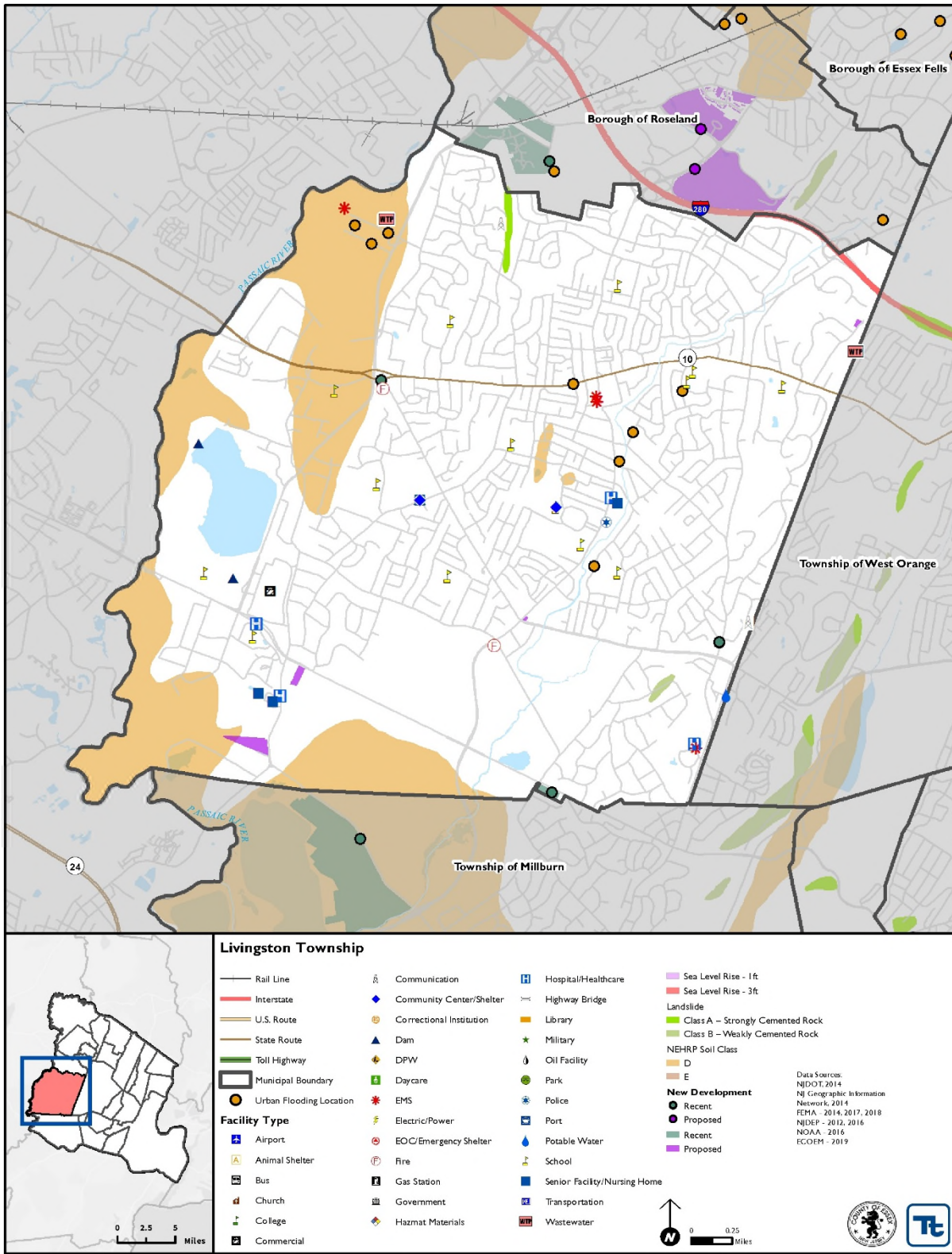




Figure 9.11-2. Township of Livingston Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of Livingston
 Name and Title Completing Worksheet: Jeannette Harduby, Township Engineer

Action Worksheet			
Project Name:	Stream Cleaning		
Project Number:	2020-LIVINGSTON-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Residences are flooding and stream banks are eroding in Canoe Brook, Cub Brook, and Slough Brook.		
Action or Project Intended for Implementation			
Description of the Solution:	Stream cleaning and restoration to reduce flooding, streambank erosion and channel sedimentation.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	n/a	Estimated Benefits (losses avoided):	Eliminates flood damage.
Useful Life:	4 years	Goals Met:	
Estimated Cost:	High (\$1M)	Mitigation Action Type:	NSP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short (1 year)
Estimated Time Required for Project Implementation:	Medium (3 years)	Potential Funding Sources:	FEMA HMGP and FMA
Responsible Organization:	Township Engineering, Public Works	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Relocate homes	High	Not feasible
	Concrete line all streams	High	Not feasible
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Livingston
 Name and Title Completing Worksheet: Jeannette Harduby, Township Engineer

Action Worksheet		
Project Name:	Stream Cleaning	
Project Number:	2020-LIVINGSTON-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	0	
Legal	1	
Fiscal	1	
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	



Name of Jurisdiction: Township of Livingston
 Name and Title Completing Worksheet: Jeannette Harduby, Township Engineer

Action Worksheet			
Project Name:	Drainage Study and Improvements		
Project Number:	2020-LIVINGSTON-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Several locations throughout the Township have been identified as areas in need of study to determine what flood abatement options exist. These areas have historically flooded due to undersized drainage systems, lack of drainage structures or poorly maintained structures. The level of flooding varies by location, with most areas limited to street flooding and in some cases attached garages.		
Action or Project Intended for Implementation			
Description of the Solution:	The purpose of the Drainage Study is to perform hydrological and hydraulic studies of each area to determine drainage improvements and probable costs. The locations include Rockhill Drive, 31 Morningside Drive & Vicinity, 36 Bryant Drive & Vicinity, 59 Elmwood Drive & Vicinity, Broadlawn Culvert, Royal Avenue, Arrow Drive, 14 Borden Place & Vicinity, Hazel Avenue, Chestnut Street, Hastings Lane and Stratford Drive.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year flood	Estimated Benefits (losses avoided):	Eliminate flood damages
Useful Life:	n/a	Goals Met:	1.2, 2.2
Estimated Cost:	\$500,000	Mitigation Action Type:	LPR
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Project Implementation:	3 years	Potential Funding Sources:	FEMA HMGP, FMA, Township
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Raise Streets and Homes above Flood Elevation	High	Not Feasible
	Close Affected Streets to Traffic and Relocate Affected Residents	High	Not Feasible
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Livingston
 Name and Title Completing Worksheet: Jeannette Harduby, Township Engineer

Action Worksheet		
Project Name:	Drainage Study and Improvements	
Project Number:	2020-LIVINGSTON-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Flooding is mitigated to not cause damage.
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support.
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



TOWNSHIP OF MAPLEWOOD

MUNICIPALITY AT A GLANCE

Total Population: **24,706**

Total Land Area: **3.9 sq mi**

Total # Buildings: **6,738**



1% Annual Chance Flood



242

Population Residing
in Floodplain



9

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$1.9 Million

Potential Building Damages



\$4.2 Million

Potential
Building Damages



0

Critical Facilities
in Floodplain

NFIP Statistics



128 # NFIP
Policies

11 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resources
Protection, Emergency Service, Structural
Projects, Climate Resilience, Community
Capacity Building

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9.12 TOWNSHIP OF MAPLEWOOD

This section presents the jurisdictional annex for the Township of Maplewood. The annex includes a general overview of the Township; an assessment of the Township’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 hazards.

9.12.1 Hazard Mitigation Planning Team

The following individuals are the Township of Maplewood’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: Sonia Viveiros / Business Administrator Address: Maplewood Town Hall, 574 Valley Street, Maplewood, NJ 07040 Phone Number: 973-762-8120 x 2000 Email: sviveiros@twp.maplewood.nj.us	Name / Title: Jim DeVaul / Chief of Police Address: Maplewood Police Department, 1618 Springfield Ave, Maplewood, NJ 07040 Phone Number: 973-761-7901 Email: jdevaul@twp.maplewood.nj.us
NFIP Floodplain Administrator	
Name / Title: Paul Kittner, Engineering Department Address: Maplewood Town Hall, 574 Valley St, Maplewood, NJ 07040 Phone Number: 973-762-8120 x 3300 Email: pkittner@twp.maplewood.nj.us	

9.12.2 Jurisdiction Profile

Township of Maplewood is located near the convergence of Interstate-78 and the Garden State Parkway. Communities bordering Maplewood include South Orange to the North, Irvington to the East, Union to the South, and Millburn to the West. The East Branch of the Rahway River runs through the middle of the Township. Total land area for the Township of Maplewood is 3.879 square miles of which 3.877 square miles are land and 0.002 square miles are water (Maplewood Township New Jersey, 2014).

The area now known as the Township of Maplewood was settled in 1675 by the Dutch, English, and French Puritans. Maplewood developed into a center for trade and light manufacturing as it was a stagecoach stop between Newark, Jersey City, and Morristown. Cider, rum, honey, and livestock were major sources of trade. In 1922, Maplewood parted from South Orange Township and became known as Maplewood (Maplewood Township New Jersey, 2014). Township of Maplewood operates using a five-member township Committee, which selects a Mayor annually (Maplewood Township New Jersey, 2014).

According to the U.S. Census, the 2010 population for the Township of Maplewood was 23,867. The estimated 2017 population was 24,706, a 3.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 7.6 percent of the population is 5 years of age or younger and 11.6 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.



9.12.3 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. Table 9.12-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 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, where available.

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	1,816	1,838	1,992	2,285	2,113
Multi-Family	23	12	28	16	11
Other (commercial, mixed-use, etc.)	129	150	169	106	14
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					
Avalon Bay	Apartments	235	200 Boyden Avenue	No	Completed
Clarus	Retail and Apartments	20 Apartments + Retail	160 Maplewood Ave	No	Completed
Maplewood Crossing	Apartments	126	92 Burnett Ave	No	Completed
Elite Properties	Apartments	30	1687-1701 Springfield Ave	No	Completed
Carelli Apartments	Apartments	30	Tuscan/Boyden	No	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None					

* Only location-specific hazard zones or vulnerabilities identified.

9.12.4 Capability Assessment

The Township of Maplewood 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 Maplewood.



Table 9.12-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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 of New Jersey	Building	State	Yes	No	No
<i>Comment: Code Enforcement Laws: New Jersey Administrative Code 5:23-2.14 and 2.16 are referenced on the Construction Code Enforcement website https://www.twp.maplewood.nj.us/building-department/pages/construction-code-enforcement and link to the Uniform Construction Code https://www.state.nj.us/dca/divisions/codes/codreg/ucc.html.</i>							
Zoning Code	Yes	Township of Maplewood	Zoning	No	Yes	No	No
<i>Comment: Maplewood Code Chapter 271 Zoning and Development Regulations, Adopted by the Township Committee of the Township of Maplewood 12-9-1986. Amendments noted where applicable. Purpose is to secure safety from fire, flood, panic and other natural and man-made disasters.</i>							
Subdivisions	Yes	Township of Maplewood	Zoning	No	Yes	No	No
<i>Comment: Maplewood Code Chapter 271 Zoning and Development Regulations, Adopted by the Township Committee of the Township of Maplewood 12-9-1986. Amendments noted where applicable. Residential Site Improvement Standards (State)</i>							
Stormwater Management	Yes	Township of Maplewood	Engineering	DEP	Yes	No	No
<i>Comment: Maplewood Code Chapter 238, Adopted 2006</i>							
Post-Disaster Recovery	No	-	-	-	No	-	-
<i>Comment:</i>							
Real Estate Disclosure	No	-	-	-	No	-	-
<i>Comment:</i>							
Growth Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Site Plan Review	Yes	Township of Maplewood	Zoning and Building	No	Yes	No	No
<i>Comment: Maplewood Code Chapter 271, Adopted 2005. No zoning permit, building permit or certificate of occupancy shall be issued in any flood hazard area until all plans are compatible with the floodplain regulations of this chapter</i>							
Environmental Protection	No	-	-	-	No	-	-
<i>Comment:</i>							
Flood Damage Prevention	Yes	Township of Maplewood	Engineering	FEMA	Yes	No	No
<i>Comment: Maplewood Code Chapter 271, Attachment 1, April 7, 1987, August 15, 2005.</i>							
Emergency Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							



Section 9.12 - Township of Maplewood

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Disaster Reconstruction Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Other: Riparian Buffer	Yes	Township of Maplewood	Engineering	NJDEP	Yes	No	No
<i>Comment: Riparian Buffer. Chapter 213. Integrated with the requirements of the Stormwater Management rule.</i>							
Other: Historic Preservation	Yes	Township of Maplewood	Historic Preservation Commission	SHPO	No	No	No
<i>Comment: Historic Preservation Ordinance of the Township of Maplewood. October 19, 2010. Chapter 271, Article VIII. Integrated with Master Plan of Township of Maplewood.</i>							
Other: Open Space Trust Fund	Yes	Township of Maplewood	Open Space Trust Fund Advisory Committee	SHPO	No	No	No
<i>Comment: Open Space Trust Fund Advisory Committee. Chapter 47. Adopted 2008. Integrated with to new development or land disturbance.</i>							
Other: Steep Slopes	Yes	Township of Maplewood	Engineering, Consulting Planner	No	No	No	No
<i>Comment: Steep Slopes. Chapter 237A.</i>							
Other: Water Conservation	Yes	Township of Maplewood	Engineering	No	No	No	No
<i>Comment: Unable to locate.</i>							
Planning Documents							
Comprehensive / Master Plan	Yes	Township of Maplewood	Engineering, Consulting Planner	No	Yes	No	Yes
<i>Comment: Adopted 2004 with reexamination 2011. 2020 MAPLEWOOD-013 provides for including reference to Essex County HMP into master plan update.</i>							
Capital Improvement Plan	Yes	Township of Maplewood	Engineering	No	No	No	No
<i>Comment: Updated annually</i>							
Disaster Debris Management Plan	Yes	Township of Maplewood	DPW	No	No	Yes	Yes
<i>Comment: Unable to locate plan. Referenced in 2020 MAPLEWOOD-008.</i>							
Floodplain or Watershed Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Stormwater Management Plan	Yes	Township of Maplewood	Engineering	NJDEP	Yes	No	No
<i>Comment: The SWPPP August 2018 https://www.twp.maplewood.nj.us/sites/maplewoodnj/files/uploads/stormwater_pollution_prevention_plan_revised_august_2018.pdf provides both the SWPPP and the Stormwater Management Plan.</i>							
Stormwater Pollution Prevention Plan	Yes	Township of Maplewood	Engineering	NJDEP	Yes	No	No
<i>Comment: SWPPP August 2018 https://www.twp.maplewood.nj.us/sites/maplewoodnj/files/uploads/stormwater_pollution_prevention_plan_revised_august_2018.pdf.</i>							





Section 9.12 - Township of Maplewood

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Urban Water Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Habitat Conservation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Economic Development Plan	Yes	Township of Maplewood	Administration	No	No	No	No
<i>Comment: Adopted 1999</i>							
Shoreline Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Community Wildfire Protection Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Community Forestry Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Transportation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Agriculture Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Business Development Plan	Yes	Township of Maplewood	Planning Board	No	No	No	No
<i>Comment: Redevelopment Plan. Adopted April 3, 2012</i>							
Other: Open Space Plan	Yes	Township of Maplewood	Open Space Trust Fund Advisory Committee	No	No	No	No
<i>Comment: Taxes collected for open space.</i>							
Other: Stream Corridor Management Plan	Yes	Township of Maplewood	Engineering	No	No	Yes	Yes
<i>Comment: Plan drafted in 2006. Mitigation actions 2020 MAPLEWOOD-002, 003, 005, 006, and 012 involve management of lengths of stream corridor that affects Maplewood Township.</i>							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of Maplewood	OEM	County, State	Yes	No	Nos
<i>Comment: Adopted 2019.</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	No	-	-





	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
<i>Comment:</i>							
Post-Disaster Recovery Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Continuity of Operations Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Public Health Plan	No				No	-	-
<i>Comment:</i>							
Other: Emergency Response Plan	Yes	Township of Maplewood	OEM	No	No	No	No
<i>Comment: Adopted 2018.</i>							

Table 9.12-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Building Department
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 No vacant land is available

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Maplewood.

Table 9.12-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Mitigation Planning Committee	No	Engineering Public Works & Planning Committee
Environmental Board / Commission	Yes	Environmental Committee
Open Space Board / Committee	Yes	Open Space Trust Committee
Economic Development Commission / Committee	Yes	Economic and Entrepreneurship Development Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Code Red, Nixle
Maintenance program to reduce risk	Yes	DPW
Mutual aid agreements	Yes	Fire, EMS
Technical/Staffing Capability		



Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering Dept, Planning and Zoning Board Engineers
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering Dept.
Planners or engineers with an understanding of natural hazards	Yes	Engineering Dept.
Staff with training in benefit/cost analysis	No	Engineering Dept.
Staff with training in green infrastructure	Yes	Engineering Dept., Green Team
Staff with education/knowledge/training in low impact development	Yes	Engineering Dept., Green Team
Surveyors	No	Contractor for Engineering Dept.
Stormwater Engineer	Yes	Contractor for Engineering Dept.
Personnel skilled or trained in GIS applications	Yes	Contractor for Engineering Dept.
Scientist familiar with natural hazards in local area	Yes	Engineering Dept, Environmental Committee, Green Team
Emergency manager	Yes	Fire
Watershed Planner		Engineering Department, Contractor for Engineering Dept. NJAW
Environmental Specialist		Contractor for Engineering Dept.
Grant writers	Yes	Community Development
Resilience Officer	No	Police/Fire Departments
Other: Sustainability Manager	Yes	Green Team

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Maplewood.

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, Assessment
User Fees for Water, Sewer, Gas or Electric Service	Yes, sewer fees, Water through NJAW, Gas PSEG
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 Township of Maplewood.





Table 9.12-7. 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?	No
<ul style="list-style-type: none"> Do you have hazard mitigation information available on your website? 	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Fire Department Website
<ul style="list-style-type: none"> Do you use social media for hazard mitigation education and outreach? 	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Facebook, Twitter
<ul style="list-style-type: none"> Do you have any citizen boards or commissions that address issues related to hazard mitigation? 	Yes

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Maplewood.

Table 9.12-8. 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	2019
Storm Ready Certification	No	-	-
Firewise Community Classification	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.

The municipality has access to resources to determine the possible impacts of climate change upon the municipality. The township administration is supportive of integrating climate change in policies or actions. Climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality.

Table 9.12-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Earthquake	Low
Extreme Temperature	Medium
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Storm (<i>high wind, tornado, TSTM, and hail</i>)	High
Winter Storm (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Low
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Medium
Hazardous Substances	Low
Utility Interruption	High
Terrorism	Low
Transportation Failure	Low

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 9.12-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering Dept.
Who is your floodplain administrator? (department/position)	Engineering Dept./Township 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?	2005
Does your floodplain management program meet or exceed minimum requirements?	Meets
<ul style="list-style-type: none"> If exceeds, in what ways? 	N/A
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 7/31/2008, GTA: 5/6/2013
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
<ul style="list-style-type: none"> If so, state what they are. 	N/A
Are any RiskMAP projects currently underway in your jurisdiction?	No
<ul style="list-style-type: none"> If so, state what they are. 	N/A
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes, FIRM Map
<ul style="list-style-type: none"> If no, state why. 	N/A
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
<ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	N/A



Criterion	Response
Does your jurisdiction participate in the Community Rating System (CRS)?	No
• If yes, is your jurisdiction interested in improving its CRS Classification?	N/A
• If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?	128
• What is the insurance in force?	\$30,873,100
• What is the premium in force?	\$199,589
How many total loss claims have been filed in your jurisdiction?	105
• How many claims are still open or were closed without payment?	41
• What were the total payments for losses?	\$1,178,060
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, addressed as needed

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

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of Maplewood made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- Installation of Emergency Generators throughout most municipal buildings.
- Installation of Emergency Generator transfer switch located at Memorial Library.
- Stabilization of retaining walls along Rahway River along Memorial Park.
- Engineering Department sends out information to homeowners in low-lying areas for installing backflow preventers to prevent sanitary sewer overflows.
- The Township of Maplewood participates in the Sustainable Jersey program and achieved Silver certification. Actions for certification on October 28, 2019 with 440 points were provided in the certification report at http://www.sustainablejersey.com/certification/participating-communities/certification-report/?tx_sjcert_certification%5Bcertification%5D%5B_identity%5D=777&tx_sjcert_certification%5Baction%5D=slow&tx_sjcert_certification%5Bcontroller%5D=Certification&cHash=f95ef82f88283109e1092e5f0c94e775.
- The Township of Maplewood Hilton Branch Library installed a successful rain garden as green infrastructure.

9.12.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Maplewood’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.12-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.



Table 9.12-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard DR-4264	Yes	<p>Low pressure moving across the deep South on January 21 and January 22 intensified and moved off the Mid Atlantic coast on January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.</p> <p>At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.</p>	<p>No direct losses to the Township during this storm. The Township performed the following activities during the eligible 48-hour period: DPW snow related activities included plowing and clearing of all roadways under the responsibility of the jurisdiction; snow removal from roofs of public facilities and from sidewalks, parking lots, and other areas under the applicant's jurisdiction; salting and sanding of all areas where eligible snow removal has occurred.</p> <p>Maplewood PD patrolled township wide and provided necessary services to protect public health & safety and prevent damage to improved public and private property.</p> <p>Maplewood FD employed the necessary personnel to ensure the ability to adequately respond to alarms due to the significant snowfall and lack of availability of mutual aid.</p> <p>Total expenditures by the Township for labor, materials and equipment for emergency protective measures were \$173,594.08, of which \$155,838 were deemed eligible expenses.</p>
3/14/17	Winter Storm	No	Rapidly deepening low pressure tracked up the eastern seaboard on March 14, bringing 8 to 13 inches of heavy snow and sleet, along with strong winds across Northeast New Jersey.	No Losses.
1/4/18	Winter Storm	No	The low pressure rapidly intensified through January 4, as it moved north-northeast along the coast. The rapid intensification of the storm led to heavy snow, strong winds, and near-blizzard conditions across northeast New Jersey, with 8.4 inches of snow and winds gusts of 44 MPH reported at Newark Liberty Airport.	No losses.
3/7/18	Winter Storm	No	A strong low-pressure system tracked along the coast through late March 7 and early morning on March 8 bringing heavy wet snow,	During this storm the DPW removed 3,744 cubic yards of vegetative debris from roadways for disposal. Total cost



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			<p>strong gusty winds, and thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times, resulting in 1 to 2 feet, which brought down trees and some power lines.</p>	<p>for straight time, overtime, equipment and contractor disposal was \$95,382. Emergency protective measures included: The EOC set up by Police provided evacuation operations, sheltered two elderly residents in the EOC with assistance from municipal workers, provided rescues caused by trees falling on homes, and responded to fires caused by down live power lines. Police closed roads and worked with DPW to ensure emergency access routes were passable to best possible given the amount of trees and power lines down. Police and Fire and DPW responded to 35 trees down along with live power lines and numerous road closures and performed wellness checks. Fire Dept. ensured no home fires due to the live power lines entangled on properties, while the Police provided access for Utility Company to repair electrical poles and lines safely. Total cost to the Township was \$64,109.</p>
11/15/18	Winter Storm	No	<p>A wave of low pressure developed along the Middle Atlantic coast November 15. The heavy, wet snow significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, causing many power outages. Newark Airport reported 6.4 inches of snow.</p>	No losses.
1/30/19	Strong Wind	No	<p>Strong winds occurred behind low pressure and cold front, with 30 mph sustained winds measured at Caldwell Airport.</p>	No losses.
3/15/19	Thunderstorm Wind, Hail	No	<p>A cold front moved through the region triggering strong to severe thunderstorms across northeast New Jersey.</p>	No losses.



9.12.6 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. **Error! Reference source not found.** summarizes the risk assessment results used to inform the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Maplewood.

- Number of repetitive loss (RL) properties: 11
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Note: RL and SRL as of 03/31/2019.



Table 9.12-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,875,272	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$13,531,920	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500- Year Mean Return Period Event	NEHRP D&E:	0	NEHRP D&E:	0	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$2,343,955	
						2,500-year Loss:	\$40,300,317	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,867	Physical 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.		Low
		Population Below Poverty Level:	1,337					
Flood	100- and 500-Year Mean Return Period Event	100-year	242	100-year	65	100-year Loss:	\$4,154,899	High
		500-year	242	500-year	65			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	117	Class B:	33	Class B:	\$17,862,543	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



CRITICAL FACILITIES

Maplewood does not have any facilities located in the 1-percent and 0.2-percent floodplains.

Table 9.12-12. Potential Flood Losses to Critical Facilities

Name	Type	Exposure	
		1% Event	0.2% Event
No critical facilities or lifelines located in the floodplain			

**Identified lifeline*

ADDITIONAL IDENTIFIED VULNERABILITIES

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), at the time the FIS for the Township of Maplewood was published, local flooding was due mainly to poor drainage. The storm sewer system was originally designed for 5- to 10-percent-annual-chance storms and the storm sewer could not accommodate rainfall resulting from the 1-percent-annual-chance storm (FEMA FIS 2014).

The Township of Maplewood has sustained damages from floods that have occurred in the past, with the historic floods occurring during July 1901, February 1902, October 1903, August 1927, July 1938, August 1955, September 1971, and August 2, 1973. The damaging storms occurred in Maplewood during the floods of August 2, 1973, and July 1938. The historic flooding occurred during the storm of October 1903; however, because of the absence of development in the community, damages were not as great as those caused by the August 2, 1973 flood (FEMA FIS 2014).

Additionally, the municipality has identified the following hazard problems and/or problem areas:

- Structures located along the stream corridors are subjected to flooding during large storm events.
- Elevate and floodproof Skate House in Memorial Park.
- Clean out and stabilization of Lightning Brook.
- Clean out and stabilization of Crooked Brook.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Maplewood 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 Maplewood has significant exposure; Figure 9.12-1 and Figure 9.12-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 Essex 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 for the Township of Maplewood. During the review of the calculated hazard ranking, the Township adjusted the





calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Maplewood has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community, as reported in Table 9.12-13. During the review of the hazard ranking, the Township indicated the following:

- The Township changed the hazard ranking for flood from low to medium.

Table 9.12-13. Township of Maplewood Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Low	Low

9.12.7 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 9.12-14. 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 #
Maplewood-1 Obtain backup power for critical facilities to ensure continuity of operations. Locations identified at the time of this HMP update: 1. Maplewood Community Center 2. Maplewood Main Library 3. Maplewood Municipal Building 4. Town Hall	Township OEM	Complete	No	Generators 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 #
5.Community Center 6.Mobile generator for various sites				
Maplewood-2 Repair the Board of Education parking lot damage due to hurricane rains	South Orange and Maplewood School District (SOMSD)	No progress	Yes, TAP grant denied	2020 MAPLEWOOD-001
Maplewood-3 Public building improvements as needed. No specific projects at this time.	Township Engineering	In progress	Fire Station, Memorial Library, Civic House and Skate House Bldgs.	2020 MAPLEWOOD-002
Maplewood-4 Increase drainage capacity of the drainage culvert on Mountain, Maple and Berkley St. to mitigate flooding	Township Engineering	Complete, spent around \$800k	No	-
Maplewood-5 Stream bank improvements to stabilize the banks of Lightning Brook	Township Engineering	No progress	Yes, will cost \$3-\$5M	2020 MAPLEWOOD-003
Maplewood-6 Streambank stabilization of the East Branch of the Rahway River	South Orange and Maplewood School District	No progress	Continue. Complete for park. Private properties are not stabilized. USACE \$10-15M	2020 MAPLEWOOD-004
Maplewood-7 Drainage upgrades in the Orchard Study Area to reduce flooding	Township Engineering	No progress	Yes	2020 MAPLEWOOD-006
Maplewood-8 Drainage upgrades to Wyoming/Jefferson	Township Engineering, FPA	No progress	No	-
Maplewood-9 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. Assess and prioritize non-structural flood hazard mitigation alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation depending on feasibility. The parameters for feasibility for this initiative would be: funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available. Although the Township has a limited number of at-risk homes and no specific properties identified at this time, the Township is willing to assist any property owner that seeks help to reduce future damages.	Supervisor's Office	No progress	No, not a priority	-
Maplewood-10 Develop and implement an enhanced all-hazards, public	Township Engineering, FPA	Complete	No	-



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 #
<p>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</p> <ul style="list-style-type: none"> • Providing information on the Township Website to inform residents about development in flood plains and wetlands. Informing residents about FEMA and how to find information there. • Provide information to residents on the Township web site about Emergency Management. • Provide emergency notifications to residents through the Code Red system 				
<p>Maplewood-11 Develop and implement a post-event damage assessment program, including the following elements:</p> <ul style="list-style-type: none"> • Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. • Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. • Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Township (e.g. building permit process). 	FPA	Complete	No, town has mechanism to address	-
<p>Maplewood-12 Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.</p>	FPA	No progress	No, not a priority	-
<p>Maplewood-13 Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).</p>	FPA	No progress	No, not a priority	-
<p>Maplewood-14 Have designated NFIP Floodplain Administrator (FPA), and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and</p>	FPA	In progress	Yes	2020 MAPLEWOOD-007



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 #
New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).				
Maplewood-15 Enhance/expand tree maintenance program and coordination with utilities (e.g., PSEG).	Township Engineering	Complete	No, town and PSEG have increased coordination	-
Maplewood-16 Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Township	Complete	No, EMS and Fire mutual aid agreements are in place.	-

In addition to the above progress, the Township of Maplewood identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Township of Maplewood did not identify mitigation actions that were completed but not identified in the previous HMP.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Maplewood participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Maplewood participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (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 Township of Maplewood 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.12-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.12-18 summarizes the actions by type across hazards of concern.





Table 9.12-15. 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-MAPLE WOOD-001	Emergency Generator OEM Building	Design and Install Backup Generator in OEM Building.	New	Utility Disruption	1.2, 2.1, 6.1	Township Engineering	HMGP Grant	High	\$110,000	Short	High	SIP	PP
		Design and construct backup generator for OEM Bldg.											
2020 MAPLE WOOD-002	Stabilize streambank and mitigate structures along Rahway River	The East Branch of the Rahway River experiences flooding, including to town-owned properties and RL structures that are in the floodplain.	Existing	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2, 2.3	Township Engineering	HMGP Grant	High	\$500,000	Medium	High	SIP	SP
		Investigate options for structures in the floodplain including the Civic House, Skate House, Memorial Library, Country Club, and other RL properties.											
2020 MAPLE WOOD-003	Stabilize streambank and mitigate structures along Lighting Brook	Properties flood along Lighting Brook and the river is overgrown with vegetation, walls are crumbling. An RL property is in the floodplain.	Existing	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering	HMGP / FMA Grant	High	\$5M	Medium	High	SIP	SP
		Increase floodproofing of structures and reconstruct walls containing river. Mitigate properties, including an RL property, residential houses and limited commercial properties.											
2020 MAPLE WOOD-004	Fire Headquarters upgrade	Fire Headquarters requires an upgrade and additional space.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Fire Department	HMGP / FMA Grant	High	\$3M	Long	High	SIP	PP
		Preliminary Plans and needs assessment were completed. \$3M required funding.											



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020 MAPLE WOOD-005	Orchard Study Area	The Orchard Study Area experiences flooding, including to RL structures.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering	HMGP / FMA Grant	High	High	Long	High	SIP	SP
		Investigate options for drainage improvements, including inventorying and inspecting structures, and surveying infrastructure, and mitigating flooding to 2 RL structures.											
2020 MAPLE WOOD-006	Crooked Brook	The Crooked Brook experiences flooding.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering	HMGP / FMA Grant	High	High	Long	High	SIP	SP
		Investigate options for drainage improvements, including inventorying structures and inspect structures and infrastructure.											
2020 MAPLE WOOD-007	Floodplain Administrator (FPA) become a Certified Floodplain Manager (CFM).	The FPA is currently not a CFM through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM).	New	Flood	1.3, 3.3	Township Engineering	Municipal budget	High	Low	Short	Medium	LPR	PR
		The FPA will become a CFM.											
2020 MAPLE WOOD-008	Storm services planning	Limited DPW resources during events.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.3, 6.1, 6.2	Township Administration	Municipal budget	High	Low	Short	High	SIP	ES
		Investigate options for consistent resources, including developing contracts with outside vendors for winter storm services and securing new trucks and snow plows. Reference debris management plan.											
2020 MAPLE WOOD-009	Repair the Board of Education parking lot damage due to hurricane rains	TAP grant was denied.	Existing	Coastal Storm, Flood, Severe Storm, Severe	1.2, 2.2	Township Administration	BOE Cost sharing	High	High	Long	High	SIP	SP
		Apply for grant funding or cost sharing agreement with BOE.											



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
				Winter Storm									
2020 MAPLE WOOD-010	Sanitary Sewer Improvements	Sanitary sewer lines are partially collapsed, silted up, and cracked leading to I&I into the pipes and leaking of sewage from the pipes.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering	HMGP / FMA Grant	High	High	Long	High	SIP	SP
		Assess condition of the sanitary sewer, especially on Maplewood Avenue and at Boyden Avenue. Partial studies have been completed, but the entire town needs to be assessed and prioritized. \$1M for assessment and mapping.											
2020 MAPLE WOOD-011	Stormwater Conveyance Improvement	Stormwater lines are partially collapsed, silted up, and cracked leading to I&I into the pipes and leaking of sewage from the pipes.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering	HMGP / FMA Grant	High	High	Long	High	SIP	SP
		Map MS4 and develop a plan for addressing maintenance and stormwater flooding.											
2020 MAPLE WOOD-012	Dunnell Road Drainage	Dunnell Road where Fire Headquarters need to egress, floods during extreme events, although not in the flood zone.	New	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 6.1, 6.2	Township Engineering	HMGP / FMA Grant	High	High	Long	High	SIP	SP, ES
		Investigate options for reducing flooding on the road to allow for emergency management equipment.											
2020 MAPLE WOOD-013	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP.	New	All	4.1, 5.4	Planning Board	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, PI
		Include discussion of Essex County HMP in next update.											



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020 MAPLE WOOD-014	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation.	Vulnerable structures are in the floodplain and subject to repetitive loss. Structures outside the floodplain are subject to sanitary sewer overflows, inadequate drainage, and other flooding problems. Conduct outreach to educate owners of their RL status and provide them with site-specific mitigation options. Maplewood will compile a list of mitigation activities the owners would like to pursue then develop a FEMA HMA grant to obtain funding.	Existing	Coastal Storm, Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Township Engineering, FPA	FEMA HMA, Municipal Budget	High	Medium	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 9.12-16. 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 Maplewood 001	Emergency Generator OEM Building	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020 Maplewood 002	Stabilize streambank and floodproof structures along Rahway River.	1	1	1	1	1	1	0	1	1	1	0	1	0	1	11	High
2020 Maplewood 003	Stabilize streambank and floodproof structures along Lighting Brook	1	1	1	1	1	1	0	1	1	1	0	1	0	1	11	High
2020 Maplewood 004	Fire Headquarters upgrade	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020 Maplewood 005	Orchard Study Area	1	1	1	1	1	1	0	1	1	1	0	1	1	0	11	High
2020 Maplewood 006	Crooked Brook	1	1	1	1	1	1	0	1	1	1	0	1	1	0	11	High
2020 Maplewood 007	Floodplain Administrator (FPA) become a Certified Floodplain Manager (CFM).	1	1	1	1	1	1	0	1	1	0	1	1	1	0	11	High
2020 Maplewood 008	Storm services planning	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020 Maplewood 009	Repair the Board of Education parking lot damage due to hurricane rains	1	1	1	1	0	1	0	1	1	1	1	1	0	0	10	High
2020 Maplewood 010	Sanitary Sewer Improvements	1	1	1	1	1	1	0	1	1	1	0	1	1	0	11	High
2020 Maplewood 011	Stormwater Conveyance Improvement	1	1	1	1	1	1	0	1	1	1	0	1	1	0	11	High
2020 Maplewood 012	Dunnell Road Drainage	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020 Maplewood 013	Master Plan and HMP Integration	1	1	1	0	1	1	1	0	0	1	1	0	0	0	8	Medium
2020 Maplewood-014	Support mitigation of vulnerable structures via retrofit	1	1	1	1	1	1	1	0	0	1		0	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 9.12-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Coastal Storm	-	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, -014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-013
Drought	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Earthquake	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Extreme Temperature	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Flood	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014
Geological hazards	x	x	-	x	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Severe Weather	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012m 013, 014
Severe Winter Weather	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 014	2020 MAPLEWO OD-002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014
Wildfire	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Civil Disorder	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Cyber Attack	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Disease Outbreak	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Economic Collapse	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Hazardous Substances	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Utility Interruption	2020 MAPLEWO OD-001	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-001	2020 MAPLEWO OD-001	2020 MAPLEWO OD-001	2020 MAPLEWO OD-013
Terrorism	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013
Transportation Failure	-	-	-	-	2020 MAPLEWO OD-001	-	-	2020 MAPLEWO OD-013

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.12.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Maplewood 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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

Entity	Title	Method of Participation
Sonia Alves-Viveiros	Business Administrator	Primary POC, attended 1 st and 2 nd meeting, reviewed plan
Jim DeVaul	Police Chief	Secondary POC, Attended 1 st meeting, reviewed plan
Michael Dingelstedt	Fire Chief	Attended 1 st and 2 nd meeting, reviewed plan
Paul J. Kittner Jr	Township Engineer	Attended 1 st and 2 nd meeting, reviewed plan
Len Mendola	Construction Official	Attended 1 st and 2 nd meeting, reviewed plan
Husam Zeidan	Asst. Township Engineer	Attended 2 nd meeting.
Calvin Bell	Public Works Director	Attended 2 nd meeting.



Figure 9.12-1. Township of Maplewood Hazard Area Extent and Location Map

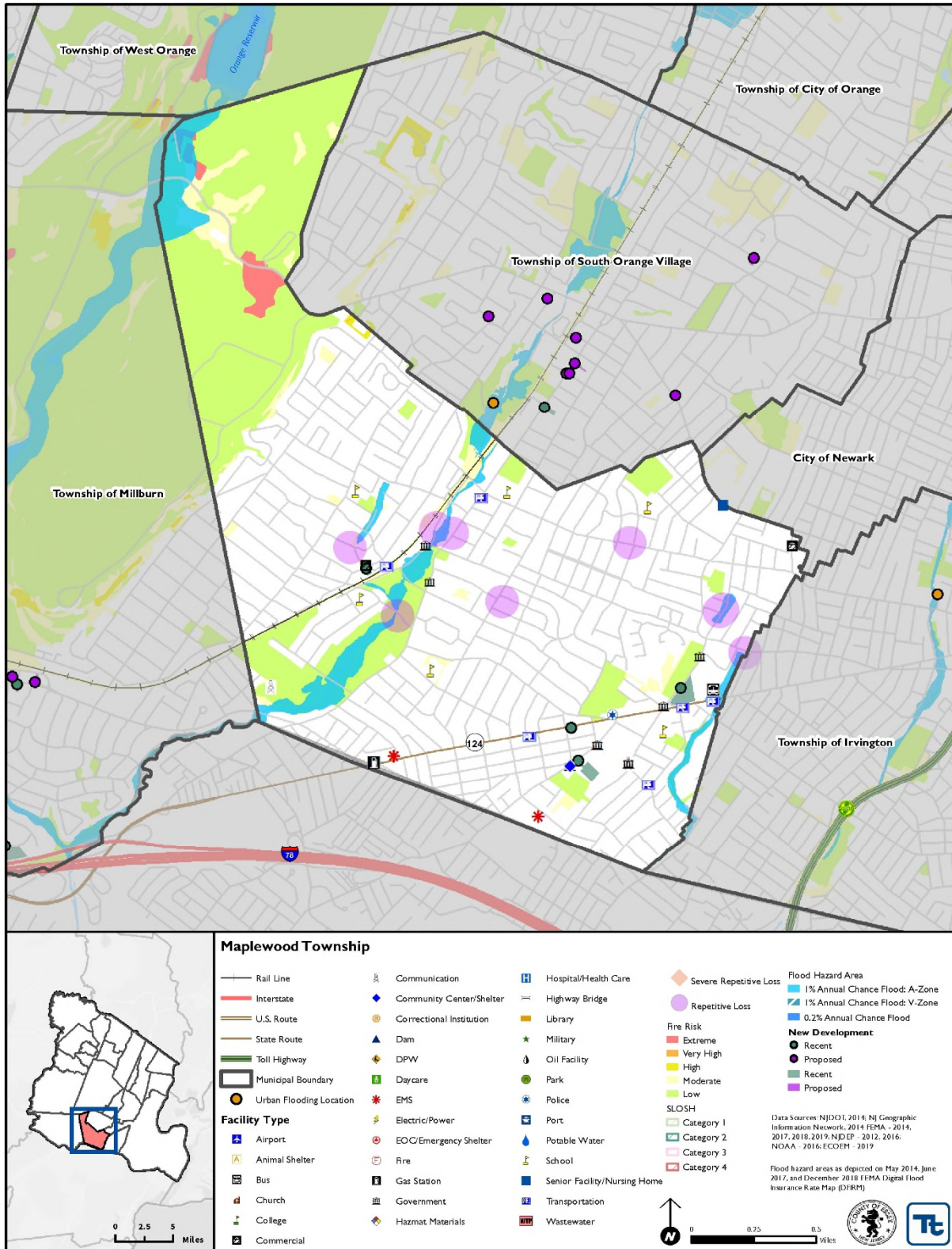
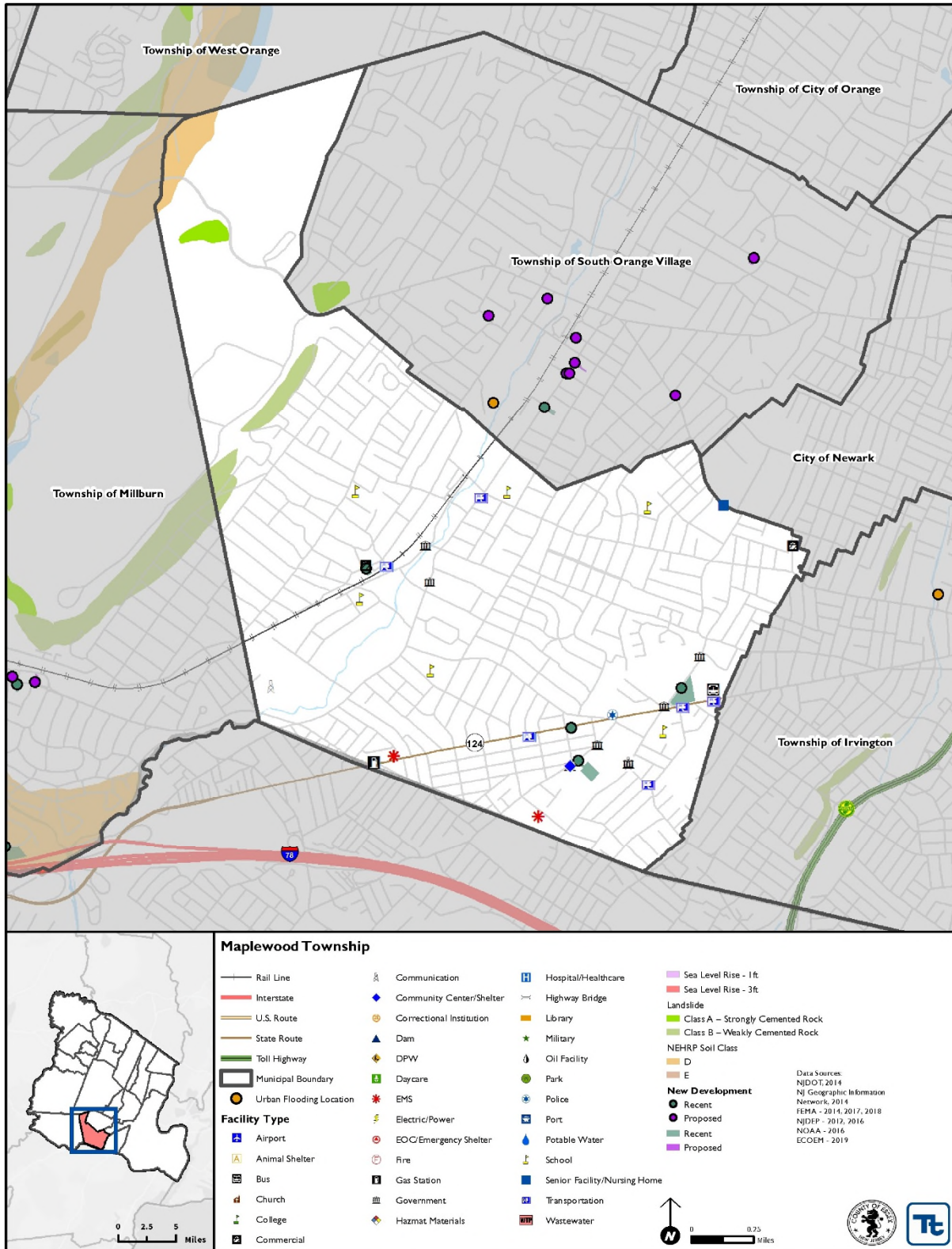




Figure 9.12-2. Township of Maplewood Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of Maplewood
 Name and Title Completing Worksheet: Paul Kittner, Jr. / Township Engineer

Action Worksheet			
Project Name:	Sanitary Sewer Infrastructure Resiliency		
Project Number:	2020-MAPLEWOOD-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flooding		
Description of the Problem:	Aging infrastructure is susceptible to ground water intrusion and infiltration/inflow from greater rainfall. Siltation is reducing the capacity of the system.		
Action or Project Intended for Implementation			
Description of the Solution:	Phase 1: Evaluate approximately 54 miles of sanitary sewer mains. Phase 2: Perform repairs of all deficiencies.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	n/a	Estimated Benefits (losses avoided):	Loss of power
Useful Life:	50+ years	Goals Met:	1.2, 2.1
Estimated Cost:	Phase 1: \$1m Phase 2: 10-15m	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	Medium	Potential Funding Sources:	HMGP, PDM grant, NJ EIT
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Township bond
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Install new sewer	\$20-50m	Cost prohibitive
	Update existing sewer	\$10-15m	Perform phases 1 and 2.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Maplewood
 Name and Title Completing Worksheet: Paul Kittner / Township Engineer

Action Worksheet		
Project Name:	Sanitary Sewer Infrastructure Resiliency	
Project Number:	2020-MAPLEWOOD-010	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Sewer backups can affect health and groundwater quality
Property Protection	1	Prevent backups and flooding
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	Repairing infrastructure reduces lawsuits.
Fiscal	0	
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Maplewood
 Name and Title Completing Worksheet: Paul Kittner / Township Engineer

Action Worksheet			
Project Name:	Repair the Board of Education parking lot damage due to hurricane rains		
Project Number:	2020 MAPLEWOOD-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The BOE parking lot between Jefferson Ave and West Parker Road is damaged from stream bank erosion from previous storm events. Access to parking lot is compromised.		
Action or Project Intended for Implementation			
Description of the Solution:	Stabilize streambank using NJDEP-approved method. Secure permits. Develop plans and evaluate bid award.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	High	Estimated Benefits (losses avoided):	Reduced damage, roads are not closed or flooded
Useful Life:	25+ years	Goals Met:	1.2, 2.2, 2.3
Estimated Cost:	\$1M	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	Long	Potential Funding Sources:	HMGP, PDM grants, BOE Funding
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Bank stabilization	High	Have shovel-ready project
	Buy out properties	High	Not feasible
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Maplewood
 Name and Title Completing Worksheet: Paul Kittner / Township Engineer

Action Worksheet		
Project Name:	Stabilize streambank and floodproof structures along Rahway River	
Project Number:	2020 MAPLEWOOD-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	NJ Transit RR is near area of erosion
Property Protection	1	Will reduce flooding and erosion
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	1	
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	1	
Timeline	0	
Agency Champion	1	
Other Community Objectives	1	Want to provide bike path and waking path to connect train stations.
Total	9	
Priority (High/Med/Low)	High	



TOWNSHIP OF MILLBURN

MUNICIPALITY AT A GLANCE

Total Population: **20,387**
 Total Land Area: **9.9 sq mi**
 Total # Buildings: **6,437**



1% Annual Chance Flood



65

Population Residing
in Floodplain



6

Persons That
May Seek Shelter



\$430 Thousand

Potential
Building Damages



6

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$2.3 Million

Potential Building Damages

NFIP Statistics



266 # NFIP
Policies

33 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resources
Protection, Emergency Services, Structural
Projects, Climate Resilience, Community
Capacity Building

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9.13 TOWNSHIP OF MILLBURN

This section presents the jurisdictional annex for the Township of Millburn. The annex includes a general overview of the Township; an assessment of the Township of Millburn’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 Township of Millburn’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
Name / Title: Captain Chris Beady / OEM Coordinator, Millburn Fire Department Address: Millburn Fire Department, 459 Essex Street, Millburn, NJ 07041 Phone Number: 973-564-7035 Email: cbeady@millburntwp.org	Name / Title: Alex McDonald / Deputy Coordinator, Business Administrator Address: Millburn Town Hall, 375 Millburn Avenue, Millburn, NJ 07041 Phone Number: 973-564-7071 Email: amcdonald@millburntwp.org
NFIP Floodplain Administrator	
Name / Title: Martha Callahan / Township Engineer, Engineering Department Address: Millburn Town Hall, 375 Millburn Avenue, Millburn, NJ 07041 Phone Number: 973-564-7052 Email: mcalahan@millburntwp.org	

9.13.2 Jurisdiction Profile

According to the U.S. Census Bureau, the Township has a total land area of 9.876 square miles, of which 9.322 square miles is land and 0.554 square miles is water. The Township of Millburn is in southwestern Essex County and is bordered to the east by the Township of Maplewood, to the north by the Township of West Orange and the Township of Livingston, to the west by Morris County municipality of Chatham, and to the south by Union County municipalities of Summit and Springfield.

Once part of Elizabethtown and Newark, Millburn Township was part of Springfield Township and created by King Charles II for his brother, James, in 1664. In 1857, Millburn Township separated from Springfield Township. Millburn Township is home to the internationally known Paper Mill Playhouse where many Broadway shows have gotten their preview start much like the Tony Award winning musical Newsies. The first planned commuter suburb in America, Short Hills, is in Millburn Township (Township of Millburn New Jersey, 2014). Millburn Township operates under the Township form of government with a five-member Committee. Annually, the Committee selects one member to serve as Mayor (Township of Millburn New Jersey, 2014).

According to the U.S. Census, the 2010 population for the Township of Millburn was 20,149. The estimated 2017 population was 20,387, a 1.2 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



12.2 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 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.13-2. 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	24	33	29	34	26
Multi-Family	0	0	0	1	0
Other (commercial, mixed-use, etc.)	0	1	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					
Extra Space Storage	Commercial	1	30 Bleeker St.	Area of undetermined flood hazard (Zone D)	Self-storage facility.
296 Millburn LLC	Mixed-Use	1	296 Millburn Ave.	Area of minimal flood hazard (Zone X)	Apartments with first floor retail.
City of East Orange Water Co.	Commercial	1	440 Parsonage Hill Rd.	Zone AE	Restaurant on the property of a public golf course.
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Mack-Cali	Multi-Family	2	150 JFK Parkway	Area of minimal flood hazard (Zone X)	200 multi-family apartment units and a hotel. Under construction.
Red Ochre Investments LLC	Commercial	1	251 Essex St.	Area of undetermined flood hazard (Zone D)	Commercial office space. Received approval from Planning Board.
517 Millburn-Short Hills Corp.	Commercial	1	517 Millburn Ave.	Area of minimal flood hazard (Zone X)	Retail. Under construction.
271 Millburn Ave LLC	Mixed-Use	1	271 Millburn Ave.	Area of minimal flood hazard (Zone X)	Residential and restaurant. Received approval from Planning Board.



* Only location-specific hazard zones or vulnerabilities identified.

9.13.4 Capability Assessment

The Township of Millburn 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 Millburn.

Table 9.13-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that Enforces (Federal, State, Regional, County, Local)	Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Millburn Township	Construction Official	State	Yes	No	No
<i>Comment: State of New Jersey Uniform Construction Code, N.J.A.C. 5:23. Adopted 2009. 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 .</i>							
Zoning Code	Yes	Millburn Township	Zoning Official	No	Yes	Yes	N/A
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Adopted by Ordinance No. 1838-84 on December 18, 1984. Amended February 5, 2019. 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. Checklist A for the Planning Board (Schedule F in the Development Regulations Appendix) includes a requirement for Floodway and Flood Hazard Area Limits and Wetlands for major site plans.</i>							
Subdivisions	Yes	Millburn Township	Planning Board	County	Yes	No	No
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance.</i>							
Stormwater Management	Yes	Millburn Township	Township Engineer	NJDEP	Yes	No	No
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Article 5 -Design and Performance Standards, Section 525 Stormwater Runoff. Ordinance No. 2394-2012.</i>							
Post-Disaster Recovery	No	-	-	-	-	-	-
<i>Comment:</i>							
Real Estate Disclosure	No	-	-	-	-	-	-
<i>Comment:</i>							



	Do you have this? (Yes/No)	Authority that Enforces (Federal, State, Regional, County, Local)	Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Growth Management	Yes	Millburn Township	Township Engineer	No	Yes	No	No
<i>Comment: Master Plan and Zoning Ordinance. State Mandated on a municipal level. See Zoning Ordinance; Also - 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.</i>							
Site Plan Review	Yes	Millburn Township	Planning Board and Zoning Board of Adjustment	No	Yes	No	No
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Planning Board and Zoning Board of Adjustment are responsible for enforcement. 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.</i>							
Environmental Protection	No	-	-	-	-	-	-
<i>Comment:</i>							
Flood Damage Prevention	Y	Millburn Township	Township Engineer and Zoning Board of Adjustment	FEMA	Yes	Yes	N/A
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Article 7 -Flood Damage Prevention. Ordinance No. 2197-02; amended in entirety by Ord. 2287-07. Master plan Ordinance #2415-13 specified that Flood Damage Prevention Ordinance was updated to change FPA from Construction Official to Municipal Engineer for FPA responsibilities.</i>							
Well Head Protection	Yes	Millburn Township	Planning Board or Zoning Board of Adjustment and the Board of Health, acting jointly and in consultation	No	No	No	No
<i>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Article 9-Well Head Protection. Ord. 2214-03.</i>							
Emergency Management	No	-	-	-	-	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	-	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	-	-	-
<i>Comment:</i>							
Disaster Reconstruction Ordinance	No	-	-	-	-	-	-
<i>Comment:</i>							
Other: Grading, Drainage, Soil Erosion, and Sediment Control	Yes	Millburn Township	Township Engineer	Hudson, Essex, Passaic	Yes	No	No



	Do you have this? (Yes/No)	Authority that Enforces (Federal, State, Regional, County, Local)	Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
				Conservation District			
<p>Comment: Township of Millburn Chapter XVII Grading, Drainage, Soil Erosion and Sediment Control. Ord. No. 2439-15. No person or entity shall clear, grade, transport, fill, excavate, remove or otherwise disturb any land area within the Township unless: 1. There has been a valid grading permit issued in accordance with Section 17-2 and this Chapter by the Township Engineer; or 2. The disturbance activity is exempt under subsection 17-1.3; or 3. The Planning Board or Board of Adjustment has approved a plan to provide for grading, drainage, soil erosion and sediment control for such land. Exemptions: a. Construction or alteration of any structure where a building permit is required and where the proposed new impervious area is less than two hundred (200) square feet; or b. Land disturbance where a building permit is not required and where the proposed land disturbance is less than five hundred (500) square feet; or c. The proposed land disturbance is in connection with an application to the Township Planning Board or Zoning Board of Adjustment where approval by that Board includes approval of a plan meeting the requirements of subsection 17-1.1.</p>							
Other: Historic Preservation	Yes	Millburn Township	Historic Preservation Commission	SHPO	No	No	No
<p>Comment: Township of Millburn Development Regulations and Zoning Ordinance. Article 8-Historic Preservation. Ord. 10-87; 8-89; 10-89; Ord. 2470-16.</p>							
Planning Documents							
Comprehensive / Master Plan	Yes	Millburn Township	Planning Board	No	Yes	No	2020-MILLBURN -003
<p>Comment: June 1985; Master Plan Updated and Adopted December 2018. https://twp.millburn.nj.us/DocumentCenter/View/4616/Adopted-Millburn-Master-Plan-Reexamination-2018-PDF. The Planning Board is responsible for implementation. The Master Plan could reference the County Hazard Mitigation Plan during the next reevaluation.</p>							
Capital Improvement Plan	Yes	Millburn Township	Millburn Township Chief Financial Officer	No	No	No	No
<p>Comment: 8 Year Capital Program 2013-2020. South Mountain Drainage Engineering Project.</p>							
Disaster Debris Management Plan	No	-	-	-	-	-	-
Comment:							
Floodplain or Watershed Plan	No	-	-	-	-	-	-
Comment:							
Stormwater Management Plan	Yes	Millburn Township	Township Engineer	NJDEP	Yes	No	No
<p>Comment: Stormwater Management Plan May 2005. Not posted to website. The Stormwater Management Plan could reference the County Hazard Mitigation Plan during the next update.</p>							
Stormwater Pollution Prevention Plan	Yes	Millburn Township	Township Engineer	NJDEP	Yes	No	No
<p>Comment: Stormwater Pollution Prevention Plan May 2005. Not posted to website.</p>							
Urban Water Management Plan	No	-	-	-	-	-	-
Comment:							
Habitat Conservation Plan	No	-	-	-	-	-	-
Comment:							
Economic Development Plan	No	-	-	-	-	-	-
<p>Comment: Under Development by Business Administrator?</p>							
Shoreline Management Plan	No	-	-	-	-	-	-
Comment:							



	Do you have this? (Yes/No)	Authority that Enforces (Federal, State, Regional, County, Local)	Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Community Wildfire Protection Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Community Forestry Management Plan	Yes	Millburn Township	Township Forester	No	No	No	No
<i>Comment: The CFMP is not available online.</i>							
Transportation Plan	Yes	Millburn Township	Planning Board	No	No	No	No
<i>Comment: Pedestrian, Bicycle, and Vehicular Circulation are discussed as an element of the Master Plan.</i>							
Agriculture Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Business Development Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Other: Open Space Plan	Yes	Township of Millburn	Planning Board	No	No	No	No
<i>Comment: June 1990; Master Plan Updated and Adopted Dec. 19, 2018 discusses Open Space, but not in separate plan.</i>							
Other: Environmental Resource Inventory Report	Yes	Township of Millburn	Environmental Commission	No	Yes	No	No
<i>Comment: March 11, 2014. https://www.twp.millburn.nj.us/DocumentCenter/View/3902/2014-Environmental-Resource-Inventory-PDF</i>							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of Millburn	Millburn OEM	County, State	Yes	No	No
<i>Comment: April 2017; Updated Plan accepted and adopted by Essex County OEM.</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-	-	-
<i>Comment:</i>							
Post-Disaster Recovery Plan	Yes	Township of Millburn	Business Administrator	No	No	No	No
<i>Comment: Feb 10, 2012; Updated Plan accepted and adopted by Essex County OEM.</i>							
Continuity of Operations Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Public Health Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Other Emergency Response Plan	Yes	Township of Millburn	Business Administrator	No	Yes/No	Yes/No	Yes/No



	Do you have this? (Yes/No)	Authority that Enforces (Federal, State, Regional, County, Local)	Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandate	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
<p><i>Comment: Updated Plan accepted and adopted by Essex County OEM.</i></p>							



Table 9.13-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Building Department
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 All lands are 100% accounted for in the township.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Millburn.

Table 9.13-5. 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, Green Team
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	SwiftReach
Maintenance program to reduce risk	Yes	Public Works clears catch basin and waterways prior to an event
Mutual aid agreements	Yes	Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer, Construction Official
Planners or engineers with an understanding of natural hazards	Yes	Township Engineer
Staff with training in benefit/cost analysis	Yes	Chief Financial Officer
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyors	Yes	Engineering Contractor
Personnel skilled or trained in GIS applications	Yes	Engineering Contractor
Stormwater engineer	No	-
Scientist familiar with natural hazards in local area	No	-



Staff/Personnel Resource	Available?	Department/Agency/Position
Emergency manager	Yes	OEM
Watershed Planner	No	-
Environmental Specialist	No	-
Grant writers	Yes	Administration Contractor
Resilience Officer	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Millburn.

Table 9.13-6. 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, sewer from tax collector
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: Sewer Connection Fee	Yes

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of Millburn.

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?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Emergency info for residents. Links to organizations. Could link to plan in future.
Do you use social media for hazard mitigation education and outreach?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Facebook, Twitter, Instagram
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Environmental Commission, Mayor's Rahway River Coalition
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Pamphlets and mailings. Brightsign board in lobby does communicate hazard information.
Do you have any established warning systems for hazard events?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	SwiftReach



COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Millburn.

Table 9.13-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	4 Residential, 3 Commercial	2011
Public Protection (Fire ISO Protection Class)	Yes	3	2007
Storm Ready Certification	No	-	-
Firewise Community Classification	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.

The municipality has access to resources to determine the possible impacts of climate change upon the municipality. The administration is supportive of integrating climate change in policies or actions. Climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality. The 2018 update to the Master Plan includes Goal 6 *Develop and implement strategies to address town-wide sustainability, resiliency and to adapt to global climate change.*

Table 9.13-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium
Earthquake	Medium
Extreme Temperature	High
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Storm (<i>high wind, tornado, TSTM, and hail</i>)	High
Winter Storm (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Low
Civil Disorder	Low
Cyber Attack	Medium
Disease Outbreak	Low
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	High
Terrorism	Medium
Transportation Failure	Low



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. Millburn has 33 repetitive loss properties and 0 severe repetitive loss properties.

Table 9.13-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering and Building
Who is your floodplain administrator? (department/position)	Engineer, Engineering
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	2007
Does your floodplain management program meet or exceed minimum requirements?	Meets
<ul style="list-style-type: none"> If exceeds, in what ways? 	N/A
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 2009 CAV: 1993
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
<ul style="list-style-type: none"> If so, state what they are. 	N/A
Are any RiskMAP projects currently underway in your jurisdiction?	Yes
<ul style="list-style-type: none"> If so, state what they are. 	1 LOMA submitted
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	No
<ul style="list-style-type: none"> If no, state why. 	Downtown might not be accurate.
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
<ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	N/A
Does your jurisdiction participate in the Community Rating System (CRS)?	No
<ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? 	N/A
<ul style="list-style-type: none"> If no, is your jurisdiction interested in joining the CRS program? 	No
How many flood insurance policies are in force in your jurisdiction?	263
<ul style="list-style-type: none"> What is the insurance in force? 	\$83,283,300
<ul style="list-style-type: none"> What is the premium in force? 	\$231,531
How many total loss claims have been filed in your jurisdiction?	308
<ul style="list-style-type: none"> How many claims are still open or were closed without payment? 	79
<ul style="list-style-type: none"> What were the total payments for losses? 	\$6,633,853
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

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

ADDITIONAL AREAS OF EXISTING INTEGRATION





In the performance period since adoption of the 2015 HMP, the Township of Millburn made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- The OEM plan specifies an evacuation and shelter plan.
- The building code accounts for many types of hazards.
- The township has a restrictive steep slopes ordinance and enforces DEP regulations for floodplain development.
- The Township of Millburn participates in the Sustainable Jersey program and achieved Silver certification. Actions for certification on October 10, 2018 with 365 points were provided in the certification report at http://www.sustainablejersey.com/certification/participating-communities/certification-report/?tx_sjcert_certification%5Bcertification%5D%5B__identity%5D=662&tx_sjcert_certification%5Baction%5D=show&tx_sjcert_certification%5Bcontrol%5D=Certification&cHash=173c4a6160b85c95d381dd86c734fd7e.

9.13.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Township of Millburn’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.13-11 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 9.13-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard DR-4264	Yes	Low pressure moving across the deep South on January 21 and January 22 intensified and moved off the Mid Atlantic coast on January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.	Force Account Labor Costs (Cat. A) - \$77,090.49 Force Account Equipment Costs (Cat. B) - \$41,342.50
3/14/17	Winter Storm	No	Rapidly deepening low pressure tracked up the eastern seaboard on March 14, bringing 8 to 13 inches of heavy snow and sleet, along with strong winds across Northeast New Jersey.	The Township did not report any losses for this event.
1/4/18	Winter Storm	No	The low pressure rapidly intensified through January 4, as it moved north-northeast along	The Township did not report any losses for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			the coast. The rapid intensification of the storm led to heavy snow, strong winds, and near-blizzard conditions across northeast New Jersey, with 8.4 inches of snow and winds gusts of 44 MPH reported at Newark Liberty Airport.	
3/7/18	Winter Storm	No	A strong low-pressure system tracked along the coast through late March 7 and early morning on March 8 bringing heavy wet snow, strong gusty winds, and thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times, resulting in 1 to 2 feet, which brought down trees and some power lines.	Force Account Labor Costs (Cat. A) - \$396,594.33 Force Account Equipment Costs (Cat. B) - \$188,055.09
8/4/18	Flash Flood		A developing area of low pressure along a surface trough helped produce heavy rainfall across parts of northeast New Jersey on the morning of August 4th that resulted in flash flooding. Rainfall amounts ranged from 1-3 inches in many places. Between the afternoon of August 3rd and the afternoon of August 4th, the Caldwell, NJ ASOS measured 2.75, and CoCoRaHS observers in Park Ridge and Hawthorne measured 2.90 and 2.95, respectively, with a CWOP station in Scotch Plains reporting 2.42. Old Short Hills Road was closed due to flooding in Millburn.	The Township did not report any losses for this event.
11/15/18	Winter Storm	No	A wave of low pressure developed along the Middle Atlantic coast November 15. The heavy, wet snow significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, causing many power outages. Newark Airport reported 6.4 inches of snow.	The Township did not report any losses for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
1/30/19	Strong Wind	No	Strong winds occurred behind low pressure and cold front, with 30 mph sustained winds measured at Caldwell Airport.	The Township did not report any losses for this event.

Notes:

9.13.6 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 9.13-12 summarizes the hazards of greatest concern and risk to the Township of Millburn.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The table below summarizes the repetitive and severe repetitive flood losses in the Township of Millburn.

- Number of repetitive loss (RL) properties: 33
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).



Table 9.13-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA Sea Level Rise: NOAA +1ft and +3ft rise	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
		SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind Category 1 through Category 4 SLOSH	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$2,278,119	High
		Category 2:	0	Category 2:	0			
		Category 3:	0	Category 3:	0	500-year Wind Loss:	\$18,249,309	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500- Year Mean Return Period Event	NEHRP D&E:	5,560	NEHRP D&E:	1,762	100-year Loss:	\$0	High
		Liquefaction Class 4:	27	Liquefaction Class 4:	9	500-year Loss:	\$4,590,624	
						2,500-year Loss:	\$72,940,336	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,492	Physical 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.		Low
		Population Below Poverty Level:	490					
Flood	100- and 500-Year Mean Return Period Event	100-year	65	100-year	19	100-year Loss:	\$429,737	High
		500-year	65	500-year	19			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	314	Class B:	92	Class B:	\$56,360,432	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	9	Wildfire:	3	Wildfire:	\$1,314,971	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Power Outage	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



CRITICAL FACILITIES

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplain and identified mitigation actions to address risk.

Table 9.13-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Campbells Pond Dam	Dam	x	x	Owned by the City of Orange. Proposed Mitigation Action 010.
Canoe Brook Dam	Dam	x	x	Owned by East Orange Board of Water Commissioners. Proposed Mitigation Action 010.
Canoe Brook Reservoir #1 Dam	Dam	x	x	Owned by New Jersey American Water. Proposed Mitigation Action 010.
Canoe Brook Reservoir #2 Dam	Dam	-	-	Proposed Mitigation Action 010. Owned by New Jersey American Water. Proposed Mitigation Action 010.
Diamond Mill Dam	Dam	x	x	Owned by the County of Essex Department of Public Works. Proposed Mitigation Action 010.
Taylor Park Pond	Dam	x	x	Proposed Mitigation Action 010.

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2, <https://nid.sec.usace.army.mil/ords/f?p=105:113:8713532089703::NO::>

ADDITIONAL IDENTIFIED VULNERABILITIES

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), stream bank overflow along the East Branch and West Branch Rahway River, the Passaic River, Canoe Brook, Taylor Brook, and Great Hills Brook is the principal flood problem within the Township of Millburn. Such flooding along the East Branch and West Branch Rahway River has caused damage to some homes and a number of commercial establishments. Flooding along the brooks primarily affects private residences and property in Millburn (FEMA FIS 2014).

Additionally, the municipality has identified the following hazard problems and/or problem areas for flooding

Millburn Township experiences flooding in areas of poor drainage and along the East and West Branches of the Rahway River. Alleviating the flooding issue requires modifying the local storm drainage system and stormwater management practices. No structures built solely for flood protection exist in the Township of Millburn (FEMA FIS 2014).

Other areas prone to flooding in the Township include:

- South Mountain section of Millburn.
- Wyoming section of Millburn.
- Meadowbrook section of Short Hills.
- Downtown area of Millburn that surrounds the West Branch of the Rahway River.
- Millburn Avenue near the East Branch of the Rahway River.

HAZARD AREA EXTENT AND LOCATION





Hazard area extent and location maps were generated for the Township of Millburn 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 Millburn has significant exposure. A map of the Township of Millburn 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 of the plan. 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 Essex 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 Millburn. The Township of Millburn has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community, as reported in Table 9.13-14.

During the review of the hazard ranking, the Township indicated the following:

- The Township changed the hazard ranking for flood from low to high due to the Rahway and Passaic Rivers having floodplains in the town.
- The Township changed the hazard ranking for wildfire from low to medium due to the presence of the South Mountain Reservation, Cora Hartshorn Arboretum, and Greenwood Gardens in the Township.
- The Township changed the hazard ranking for cyber-attack from low to medium, as these have been witnessed already in the township.
- The Township changed the hazard ranking for economic collapse from medium to low due to the current economy.
- The Township changed the hazard ranking for transportation failure from low to medium due to the risk of infrastructure failure to the multi-modal system, including rail, highways, and air.

Table 9.13-14. Township of Millburn Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Medium	Low	High



Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Low	High	Low	Medium

9.13.7 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. Appendix F (Mitigation Strategy Supplement) provides all attributes associated with the 2015 HMP mitigation strategy.

Table 9.13-15. 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 #
Millburn-1 Millburn Haran Circle dike generator.	Township OEM	Complete	-	-
Millburn-2 Millburn Gilbert Place generator.	Township OEM	In progress.	Yes	2020-MILLBURN - 001
Millburn-3 Millburn Ridgewood Road generator.	Township OEM	Discontinue. Town evaluated and decided not a possibility.	-	-
Millburn-4 Millburn Police Station and EOC generator.	Township OEM	Complete	-	-
Millburn-5 Inflow/Infiltration to protect infrastructure during sanitary sewer back-ups.	Township	In progress	Yes	2020-MILLBURN - 002
Millburn-6 Fix undermined retaining wall at Arboretum Brook by stabilizing slopes susceptible to erosion.	Township DPW	Complete	-	-
Millburn-7 Township of Millburn Community Rating System membership.	Township	Discontinue. Town evaluated and decided not a possibility.	-	-
Millburn-8 Enroll local Floodplain Manager in CFM education and prepare for exam.	Township	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 #
Millburn-9 Add drainage structures to Chatham Road.	Township	Discontinue. Town evaluated and decided not a possibility.	-	-
Millburn-10 Participate in Firewise program	Township OEM	In progress.	Yes	2020-MILLBURN - 003
Millburn-11 Improve flood risk assessment for NFIP properties using GIS.	Township	Complete. Special Data Logic, data mapping contractor, provided updated maps.	-	-
Millburn-12 Form partnerships to support floodplain management.	Township	Complete. Mayors' Rahway River Coalition	-	-
Millburn-13 Improve stormwater drainage system capacity for Meadowbrook Road drainage.	Township DPW	Discontinue. Town evaluated and decided not a possibility.	-	-
Millburn-14 South Mountain storm pumps.	Township DPW	In progress	Yes	2020-MILLBURN - 004
Millburn-15 New drainage system to be constructed on Knollwood Road.	Township DPW	Complete	-	-
Millburn-16 Drainage infrastructure for private properties added to South Mountain.	Township DPW	Discontinue. Town evaluated and decided not a possibility because of easements.	-	-
Millburn-17 Participate in Storm Ready program and educate the public on how to prepare for hazards and disasters.	Township OEM	Continue. Expected in September.	Yes	2020-MILLBURN - 005
Millburn-18 Mitigation plan for 50-year storm event along east and west branches of Rahway River.	Township	Discontinue. Town evaluated and decided not a possibility.	-	-
Millburn-19 Taylor Park dam. Replace outdated leaking dam, repair undermining of concrete discharge apron and reconstruct 100ft of retaining wall along West Branch of Rahway river.	Township	Complete	-	-
Millburn-20 Support the mitigation of vulnerable structures via retrofit (e.g., elevation, flood-proofing) or acquisition/relocation	Township Engineering, FPA	In progress.	Yes	2020-MILLBURN - 006
Millburn-21 375 Millburn Ave – Town Hall - Elevate/Floodproof to the equivalent of 1 foot above the 500 Year Floodplain	Township OEM	Discontinue. Town evaluated and decided not a possibility.	-	-

The Township did not identify additional mitigation projects that were completed but not identified in the previous HMP.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Millburn participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Millburn participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 9.13-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Millburn 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.13-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.8-18 summarizes the actions by type across hazards of concern.



Table 9.13-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
2020-MILLBURN-001	Short Hills Gardens Channel	Retaining wall requires stabilization at Short Hills Gardens (469 Short Hills Ave).	New	Flood	1.2, 2.2	Township Engineering	HMGP, PDM	High	High	Medium	High	SIP	PP
		Fix undermined retaining wall at Short Hills Gardens by stabilizing slopes susceptible to erosion.											
2020-MILLBURN-002	Tree Service Contract	After storms, trees on public and private properties require immediate service.	New	Coastal Storm, Flood, Geological hazards, Severe Weather, Severe Winter Weather, Wildfire, Utility Interruption	1.2, 6.2	Township Administration, DPW	Municipal Budget	High	Low	Short	High	EAP	ES
		Adopt contract to keep tree management service on retainer. Update current EOP to reflect contract											
2020-MILLBURN-003	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP	New	All	4.1, 5.4	Planning Board	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, PI
		Include discussion of Essex County HMP in next update.											
2020-MILLBURN-004	Gilbert Place generator.	The pumps at Gilbert Place do not have backup power.	Existing	Severe Weather, Severe Winter Weather, Utility Interruption	1.2, 6.1	Township OEM	HMGP, Municipal Budget	High	\$270,000	Short	High	SIP	PP
		Purchase and install a backup generator.											
2020-MILLBURN-005	Participate in Firewise program	The South Mountain Reservation is a risk for wildfire.	Existing	Wildfire	1.1, 3.1	Township OEM	Municipal Budget	High	Low	Long	High	LPR	PR



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
		Township is enrolled as Firewise Ambassador and will further Firewise program development.											
2020-MILLBURN-006	Participate in StormReady program and educate the public on how to prepare for hazards and disasters.	Millburn Township is subject to extreme weather during storms. Township enrolled in the StormReady program to increase community readiness.	Existing	All	1.2, 3.1, 3.2	Township OEM	Municipal Budget	High	High	Long	High	LPR	PR
2020-MILLBURN-007	South Mountain storm pumps.	The South Mountain Neighborhood floods from stormwater not flowing to the Rahway River during storms. Install pumps in the South Mountain neighborhood to push the floodwater over the berm and into the Rahway River.	Existing	Flood, Severe Weather, Severe Winter Weather	1.2, 2.2	Township DPW	FEMA HMA Grants, Municipal Budget	High	High	Long	High	SIP	SP
2020-MILLBURN-008	Inflow/ Infiltration to protect infrastructure during sanitary sewer back-ups.	During rain events, stormwater infiltrates sanitary sewer pipes to cause backups. Perform an I&I study to determine the sources of infiltration into the sanitary system.	Existing	Flood	1.2, 2.2	Township	Municipal Budget	High	High	Long	High	SIP	SP
2020-MILLBURN-009	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/ relocation.	Vulnerable structures are in the floodplain and subject to repetitive loss. Compile a list of vulnerable locations and identify mitigation strategy for each.	Existing	Flood, Coastal Storm, Severe Weather, Winter Storm	1.2, 2.2	Township Engineering, FPA	Municipal Budget	High	Medium	Long	High	SIP	PP
2020-MILLBURN-010	Dam Risk Reduction	Dams are located in Millburn Township, including Campbells Pond, Canoe Brook, Canoe Brook Reservoir #1, Canoe Brook Reservoir #2, Diamond Mill, Taylor Park Pond	New	Flood, Storm, Severe Weather, Winter Storm	1.2, 2.1, 3.1, 6.1	Township Engineering, OEM, FPA, DPW, Administration	Municipal Budget	High	Medium	Medium	Medium	EAP	PR, PI, ES



Initiative Number	Mitigation Initiative Name	Description of the Problem	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
		Description of the Solution											
		Update EOP to include review of EAPs from the City of Orange (Campbells Pond), East Orange Board of Water Commissioners (Canoe Brook), NJAW (Canoe Brook Res. 1&2), Essex County DPW (Diamond Mill) and incorporate with EAP for Taylor Park Pond. Complete dam failure studies, where necessary.											

Notes:

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- EAP Emergency Action Plan
- EOP Emergency Operations Plan
- 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 9.13-17. 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-MILLBURN-001	Short Hills Gardens Channel	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-MILLBURN-002	Tree Service Contract	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-MILLBURN-003	Master Plan and HMP Integration	1	1	1	0	1	1	1	0	0	1	1	0	0	0	8	Medium
2020-MILLBURN-004	Gilbert Place generator.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-MILLBURN-005	Participate in Firewise program	1	1	1	0	1	1	1	1	1	1	0	0	1	0	10	High
2020-MILLBURN-006	Participate in StormReady program and educate the public on how to prepare for hazards and disasters.	1	1	1	0	1	1	1	1	1	1	1	0	1	1	12	High
2020-MILLBURN-007	South Mountain storm pumps.	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-MILLBURN-008	Inflow/ Infiltration to protect infrastructure during sanitary sewer back-ups.	1	1	1	1	1	1	1	0	1	1	1	1	0	1	12	High
2020-MILLBURN-009	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/ relocation	1	1	1	1	1	1	1	0	0	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-MILLBURN-010	Dam Risk Reduction	1	1	1	1	0	0	0	1	1	0	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 9.13-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion / Sea Level Rise	-	-	-	-	-	2020-MILLBURN-003	-	-
Coastal Storm	-	-	2020-MILLBURN-002	-	-	2020-MILLBURN-003	-	-
Drought	-	-	-	-	-	2020-MILLBURN-003	-	-
Earthquake	-	-	-	-	-	2020-MILLBURN-003	-	-
Extreme Temperature	-	-	-	-	-	2020-MILLBURN-003	-	-
Flood	2020-MILLBURN-001, 004, 007, 008, 009, 010	2020-MILLBURN-001, 004, 007, 008, 009, 010	2020-MILLBURN-001, 002, 004, 007, 008, 009, 010	2020-MILLBURN-001, 004, 007, 008, 009, 010	2020-MILLBURN-001, 003, 004, 007, 008, 009, 010	2020-MILLBURN-001, 003, 004, 007, 008, 009, 010	2020-MILLBURN-001, 004, 007, 008, 009, 010	2020-MILLBURN-001, 004, 007, 008, 009, 010
Geological hazards	-	-	2020-MILLBURN-002	-	-	2020-MILLBURN-003	-	011
Severe Weather	-	2020-MILLBURN-006, 007, 008, 009, 010	2020-MILLBURN-002, 004, 007, 008, 009, 010	2020-MILLBURN-006, 007, 008, 009, 010	2020-MILLBURN-006, 007, 008, 009, 010	2020-MILLBURN-003, 007, 008, 009, 010	2020-MILLBURN-006, 007, 008, 009, 010	2020-MILLBURN-006, 007, 008, 009, 010
Severe Winter Weather	-	2020-MILLBURN-006, 007, 008	2020-MILLBURN-002, 004, 006, 007, 008	2020-MILLBURN-006, 007, 008	2020-MILLBURN-006, 007, 008	2020-MILLBURN-003, 006, 007, 008	2020-MILLBURN-006, 007, 008	2020-MILLBURN-006, 007, 008
Wildfire	2020-MILLBURN-005	2020-MILLBURN-005	2020-MILLBURN-002, 005	2020-MILLBURN-005	2020-MILLBURN-005	2020-MILLBURN-003, 005	2020-MILLBURN-005	2020-MILLBURN-005
Civil Disorder	-	-	-	-	-	2020-MILLBURN-003	-	-
Cyber Attack	-	-	-	-	-	2020-MILLBURN-003	-	011
Disease Outbreak	-	-	-	-	-	2020-MILLBURN-003	-	011
Economic Collapse (new)	-	-	-	-	-	2020-MILLBURN-003	-	011
Hazardous Substances	-	-	-	-	-	2020-MILLBURN-003	-	011
Utility Interruption	2020-MILLBURN-004	2020-MILLBURN-002, 004	2020-MILLBURN-002, 004	2020-MILLBURN-002, 004	2020-MILLBURN-004	2020-MILLBURN-002, 003, 004	2020-MILLBURN-004	2020-MILLBURN-002, 011
Terrorism	-	-	-	-	-	2020-MILLBURN-003	-	011
Transportation Failure	-	-	-	-	-	2020-MILLBURN-003	-	011

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.



9.13.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Millburn 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 9.13-19. Contributors to the Annex

Entity	Title	Method of Participation
Chris Beady	OEM Coordinator	POC, Annex Meeting 1, Annex Meeting 2, reviewed notes
Martha Callahan	Township Engineer	Annex Meeting 1, Annex Meeting 2, reviewed notes
James Distano	Public Works Superintendent	Annex Meeting 2, reviewed notes
Robert Echavarria	Fire Chief/DEP Coordinator	Annex Meeting 2, reviewed notes
Jimmy Homs	Asst. Business Administrator	Annex Meeting 1, Annex Meeting 2, reviewed notes
Alex McDonald	Business Administrator	Annex Meeting 1, Annex Meeting 2, reviewed notes
Michael Mulligan	Captain Millburn PD	Annex Meeting 1, reviewed notes
Jesse Moehlman	Administrative Analyst	Annex Meeting 2, reviewed notes



Figure 9.13-1. Township of Millburn Hazard Area Extent and Location Map

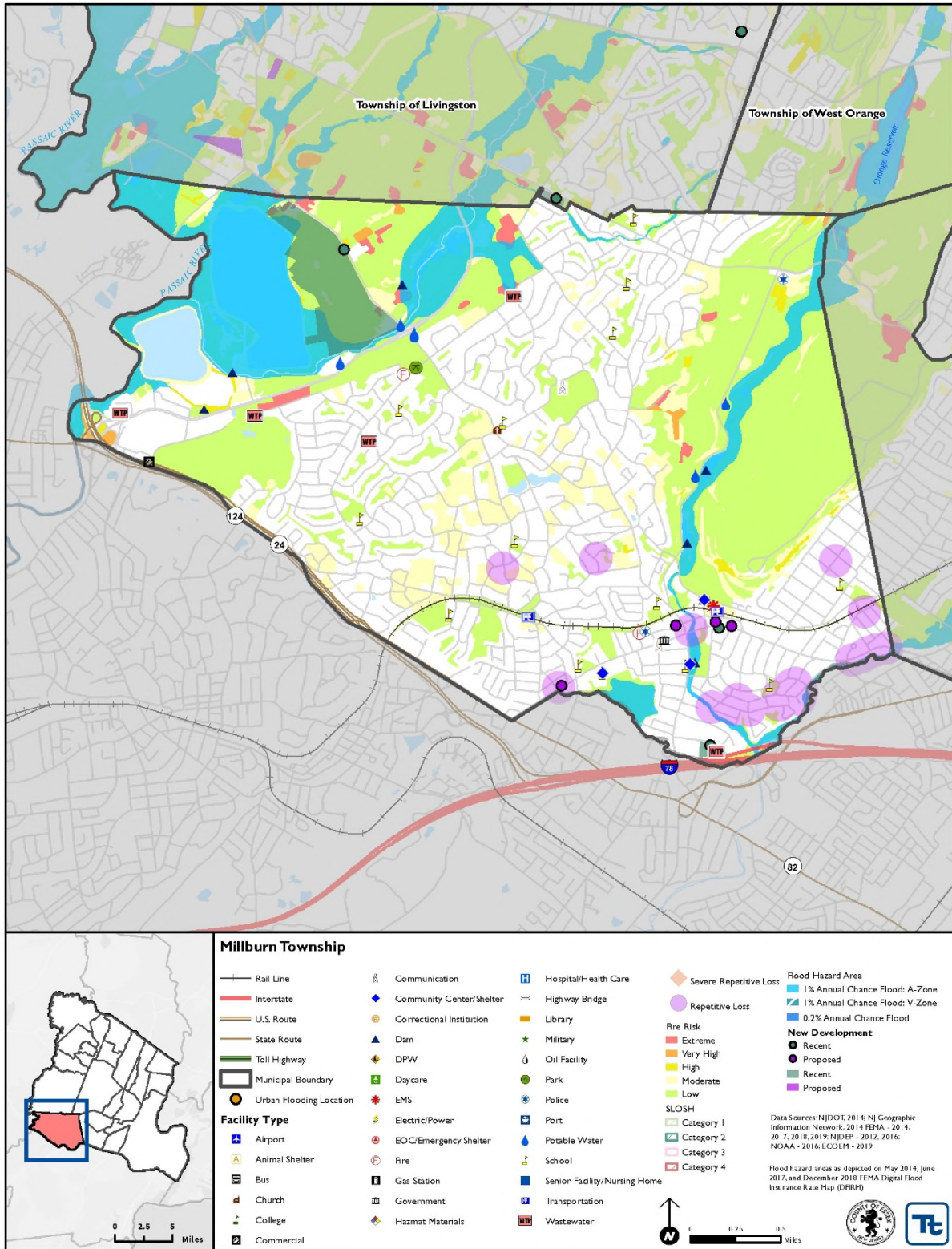
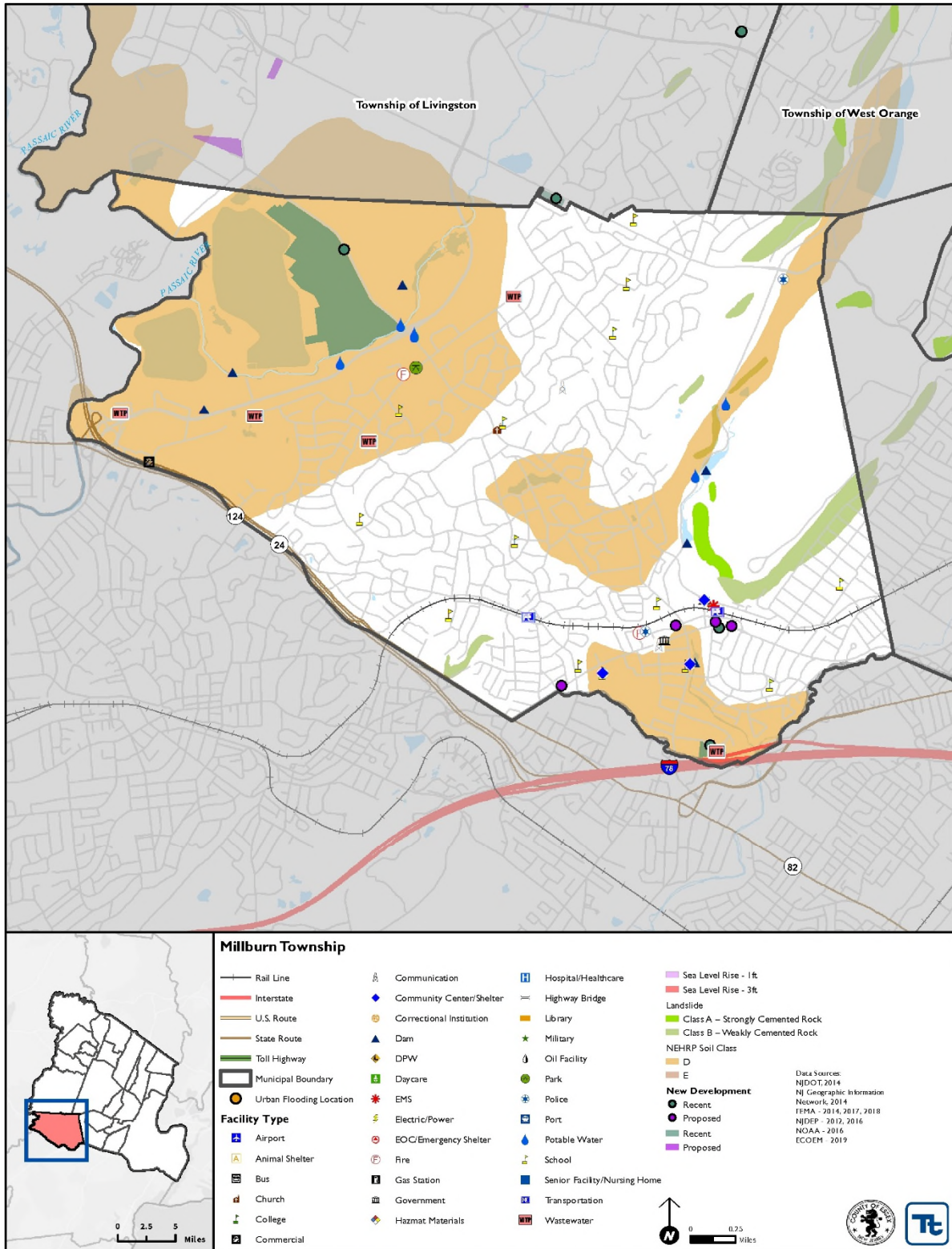




Figure 9.13-2. Township of Millburn Hazard Area Extent and Location Map 2





Name of Jurisdiction: Millburn Township
 Name and Title Completing Worksheet: Martha Callahan, Township Engineer

Action Worksheet			
Project Name:	Short Hills Gardens Channel		
Project Number:	2020-MILLBURN -001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Retaining wall requires stabilization at Short Hills Gardens (469 Short Hills Ave).		
Action or Project Intended for Implementation			
Description of the Solution:	Fix undermined retaining wall at Short Hills Gardens by stabilizing slopes susceptible to erosion.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year	Estimated Benefits (losses avoided):	High
Useful Life:	40 years	Goals Met:	1.2, 2.2
Estimated Cost:	High	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	1 month
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	Town budget
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Stabilize and backfill	Low	Temporary ensure
	Fix retaining wall	\$400,000	Complete concrete flume
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Name of Jurisdiction: Millburn Township
 Name and Title Completing Worksheet: Martha Callahan, Township Engineer

Action Worksheet	
Project Name:	Short Hills Gardens Channel



Project Number:	2020-MILLBURN -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	Town has jurisdiction over property.
Fiscal	1	
Environmental	1	Culvert is a major stormwater conveyance.
Social	1	
Administrative	1	Will save time from repetitive repairs.
Multi-Hazard	0	
Timeline	1	
Agency Champion	1	Township Engineer already has plans.
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Millburn Township
 Name and Title Completing Worksheet: Alex McDonald, Township Administrator

Action Worksheet			
Project Name:	Tree Service Contract		
Project Number:	2020-MILLBURN -002		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	After storms, trees on public and private properties require immediate service.		
Action or Project Intended for Implementation			
Description of the Solution:	Adopt contract to keep tree management service on retainer. Update current EOP to reflect contract.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	n/a	Estimated Benefits (losses avoided):	High
Useful Life:	Length of contract	Goals Met:	1.2, 6.2
Estimated Cost:	Low	Mitigation Action Type:	EAP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	Short	Potential Funding Sources:	Municipal Budget
Responsible Organization:	Township Administration	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Hire on case by case	n/a	Reactionary
	Contract for emergencies	n/a	Proactive
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Name of Jurisdiction: Millburn Township
 Name and Title Completing Worksheet: Alex McDonald, Township Administrator

Action Worksheet	
Project Name:	Tree Service Contract
Project Number:	2020-MILLBURN -002



Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Keeps roads clear and restore power after storms.
Property Protection	1	Emergency vehicles can pass during events.
Cost-Effectiveness	1	
Technical	1	
Political	1	Township is supportive of implementation.
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	Provides assistance to residents looking for help during events.
Administrative	1	
Multi-Hazard	1	Power outages, transportation failure, storm events
Timeline	1	
Agency Champion	1	Township Administrator has researched alternatives.
Other Community Objectives	1	
Total	14	
Priority (High/Med/Low)	High	



TOWNSHIP OF MONTCLAIR

MUNICIPALITY AT A GLANCE

Total Population: **38,572**
 Total Land Area: **6.2 sq mi**
 Total # Buildings: **9,436**



1% Annual Chance Flood



1,281

Population Residing in Floodplain



65

Persons That May Seek Shelter

100-Year MRP Event Wind Loss



\$4 Million

Potential Building Damages



\$6.3 Million

Potential Building Damages



4

Critical Facilities in Floodplain

NFIP Statistics



297 # NFIP Policies

21 # SRL NFIP Properties

0 # RL NFIP Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and Non-Natural Hazards

Project Types

Prevention, Property Protection, Natural Resources Protection, Structural Projects

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9.14 TOWNSHIP OF MONTCLAIR

This section presents the jurisdictional annex for the Township of Montclair. The annex includes a general overview of the Township of Montclair; an assessment of the Township’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 Township of Montclair’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: Rob Bianco, Emergency Management Coordinator, Department of Community Services Address: 219 N Fullerton Ave, Montclair, NJ 07042 Phone Number: 201-247-9405 Email: rbianco@montclairnjusa.org	Name / Title: John Herrmann, Fire Chief/DEMC Address: 1 Pine Street Montclair, NJ 07042 Phone Number: 973-809-6302 Email: jherrmann@montclairnjusa.org
NFIP Floodplain Administrator	
Name / Title: Norberto Hernandez, Township Engineer Address: - Phone Number: 973-356-5524 Email: nhernandez@negliaengineering.com	

9.14.2 Jurisdiction Profile

The area now known as Montclair Township was once part of the land of the Lenape Indians. Lenape heritage is still represented today in Montclair Township with the areas Watchung (on the hill) and Yantacaw (means place of dancing). The expansion of the railroad system in 1856 gave Montclair Township the opportunity to turn from a quiet country town into a commuter town for the people working in New York City. In 1873 five railroad stations along the Greenwood Lake line were completed. To this day, Montclair Township embraces both its country setting and easy access to New York City. There are over 40,000 trees in the many park areas and nature reserves within Montclair Township. Montclair State University can also be found in Montclair Township (Montclair Township, 2014).

Montclair Township is approximately 6.16 square miles. It is bordered by Bloomfield to the east, West Orange to the south, the Eagle Rock Reservation to the southwest, and Clifton to the northeast. The First Watchung Mountain can be found along the southern and western borders (Montclair Township, 2014). Montclair Township has used the Faulkner Act’s Council-Manager form of municipal government to set up its government operations. This style of government is also known as the Optional Municipal Charter Law. The Council is the elected power and the manager is appointed by the Council (Montclair Township, 2014).

According to the U.S. Census, the 2010 population for the Township of Montclair was 37,669. The estimated 2017 population was 38,572, a 2.4 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.2 percent of the population is 5 years of age or younger and 12.1 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.



9.14.3 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. Table 9.14-2. summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.14.1 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

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	6	8	8	11	8
Multi-Family	2	1	2	4	4
Other (commercial, mixed-use, etc.)	18	11	16	13	22
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
161-167 Glenridge Ave Development	Mixed use	17	161-167 Glenridge Ave	-	5-story mixed use
92 Elm Street Development	Residential	4	92 Elm St	-	3-lot subdivision
99 Claremont Ave Development	Residential	4	99 Claremont Ave	-	3-lot subdivision
James Street Development	Residential	6	James St	-	3-lot subdivision
58 James Street Development	Residential	5	58 James St	-	
172 Glenridge Ave Development	Mixed use	17	172 Glenridge Ave	-	5-story mixed use
19 Alexander Ave Development	Residential	3	19 Alexander Ave	-	Subdivided one lot into 3 lots
147 Bloomfield Ave Development	Residential	46	147 Bloomfield Ave	-	5-story mixed use
Seymour Street Redevelopment	Mixed use	200	Seymour St	-	Mixed-use development project containing 200 units, 35,450 sf. Office space and 40,000 sf of retail space
237-249 Lorraine Ave Development	Commercial	1	237-249 Lorraine Ave	-	13,930 square foot 2-story building with retail on first floor and office above



Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	-	Description / Status of Development and Mitigation if located in Hazard Zone
44 Pleasant Ave Development	Residential	8	44 Pleasant Ave	-	8-lot subdivision, 8 units
369-371 Bloomfield Ave Development	Mixed use	10	369-371 Bloomfield Ave	-	10-unit mixed use bldg
323 Claremont Ave Development	Commercial	1	323 Claremont Ave	-	new 7,628 sf. medical office building
19 North Fullerton Ave Development	Commercial	1	19 North Fullerton Ave	-	new 4,529 sf bank
Lackawanna Site Plan	Mixed use	154	Lackawanna Plaza	-	Mixed-use project with 154 dwelling units (retail and office space existing)
256 Park St Development	Mixed use	11	256 Park St	-	New 3-story mixed-use building with 11 units
Montclair Kimberly Academy Expansion	School	1	224 Orange Rd	-	11,483 sf school expansion
111-113 Grove St Development	Commercial	1	111-113 Grove St	-	new 18,880 sf 2-story retail/office building
11 & 13 Washington St Development	Residential	1	11 & 13 Washington St	-	Approved new 4-family home
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
65 Church St Development	Mixed use	74	65 Church St	-	Proposed 74 units in 5-story mixed use building

* Only location-specific hazard zones or vulnerabilities identified.

9.14.4 Capability Assessment

The Township of Montclair 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.



Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.X.4). The Township of Montclair 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 Montclair.

Table 9.14-3. 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 and State	Yes	Yes/No	Yes/No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Township of Montclair Construction Codes, Uniform, Chapter 121, as amended, effective 03/25/1997.</i>					
Zoning Code	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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 Code to be Amended in September 24, 2019 Township of Montclair Zoning Ordinance, Chapter 347, as amended, effective 04-29-1980.</i>					
Subdivisions	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment: 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. To be Amended September 24, 2019 Township of Montclair Subdivision of Land Ordinance, Chapter 301, as amended, effective 04-29-1980</i>					
Stormwater Management	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Township of Montclair Stormwater Control Ordinance, Chapter 295, as amended, effective 05-09-2006.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes/No	Yes/No
<i>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.</i>					
Growth Management	No	-	Yes	Yes/No	Yes/No
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Township of Montclair Site Plan Review Ordinance, Chapter 281, as amended, effective 04-15-1980.</i>					
Environmental Protection	Yes	Local	Yes		
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code. Steep Slope, Tree Protection Ordinance, Development applicants to address additional means of green infrastructure (require green roofs in redevelopment areas). Township of Montclair Steep Slopes Ordinance, Chapter 294, as amended, effective 10-06-1998. Township of Montclair Tree Ordinance, Chapter 324, as amended, effective 6-12-2002.</i>					



	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	No	Yes/No	Yes/No
<i>Comment: Township of Montclair Flood Damage Prevention Ordinance, Chapter 161, as amended, effective 05-22-2007.</i>					
Wellhead Protection	-	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Township of Montclair Master Plan Reexamination Report (2016)</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>Comment: Per N.J.S.A. 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. art of annual budgeting</i>					
Disaster Debris Management Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment: NJDEP Approval for different sites</i>					
Floodplain or Watershed Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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 Management Plan Element to Montclair Master Plan (2005)</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment:</i>					
Urban Water Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Habitat Conservation Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Conservation Element to Montclair Master Plan (2007)</i>					
Economic Development Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					



	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	Yes/No	Yes/No
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Transportation Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Unified Land use and Circulation Element to Montclair Master Plan (2016)</i>					
Agriculture Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Climate Action Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Tourism Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Business Development Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Redevelopment Plans	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Amended Hahn's Redevelopment Plan, Hospital Redevelopment Plan, New and Mission/Elm Street Redevelopment Plan, Bay Street Station Redevelopment, Pine Street Redevelopment, Montclair Center Gateway Redevelopment Plan - Phase 1, Eastern Gateway Redevelopment Plan, Seymour Street Redevelopment Plan, HUMC/Mountainside Hospital Redevelopment Plans, Deteriorated Housing Project Redevelopment Plan, Glenridge Avenue Redevelopment Plan (Has not been adopted), Montclair Center Gateway Redevelopment Area - Phase 2 (Has not been adopted)</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>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. Last completed in 2018.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment: Critical Infrastructure identified as part of EOP.</i>					
Post-Disaster Recovery Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Continuity of Operations Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Public Health Plan	Yes/No		Yes/No	Yes/No	Yes/No
<i>Comment:</i>					
Other	No	-	Yes/No	Yes/No	Yes/No
<i>Comment:</i>					



Table 9.14-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Building Office
Does your jurisdiction have the ability to track permits by hazard area?	On the application there is a section for floodplain, steep slopes applications are flagged and an engineer review.
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, not much land is left to develop.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Montclair.

Table 9.14-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board/ ZBA
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Insert appropriate information
Open Space Board / Committee	No	Insert appropriate information
Economic Development Commission / Committee	Yes	Economic Dev Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Swift911
Maintenance program to reduce risk	Yes	DPW (Roads, Catch basins, Dams/Spillways)
Mutual aid agreements	Yes	Surrounding Communities, and County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Municipal Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Planning/Code Official
Planners or engineers with an understanding of natural hazards	Yes	Community Services/Municipal Engineer
Staff with training in benefit/cost analysis	Yes	Community Services (Public Works)
Staff with training in green infrastructure	-	-
Staff with education/knowledge/training in low impact development	-	-
Surveyors	Yes	Consultant
Stormwater engineer	-	-
Personnel skilled or trained in GIS applications	Yes	Planning Department
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Department of Community Services
Grant writers	Yes	Employees write on behalf of department



Staff/Personnel Resource	Available?	Department/Agency/Position
Resilience Officer	No	-
Watershed planner	-	
Environmental specialist	-	
Other		

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Montclair.

Table 9.14-6. 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 (Water, Sewer, and Parking)
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)	-
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of Montclair.

Table 9.14-7. 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; FEMA Map Service Center, NFPA, FEMA
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, Swift911, Facebook, Twitter, TV34
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes; Capability to distribute flyers, digital signboard
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Montclair.





Table 9.14-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	-	10	Rescinded
Building Code Effectiveness Grading Schedule (BCEGS)	-	-	-
Public Protection (Fire ISO Protection Class)	Yes	2	2016/2017
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	10/31/2019

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 climate change and the jurisdiction’s rating.

Table 9.14-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	High
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	High
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood (<i>riverine / flash flood, SLR</i>)	High
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	High
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	High
Power Outages	Medium
Terrorism	Medium
Transportation Failure	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 9.14-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Municipal Engineer
Who is your floodplain administrator? (name, department/position)	Municipal Engineering (Consultant)
Are any certified floodplain managers on staff in your jurisdiction?	-
What is the date that your flood damage prevention ordinance was last amended?	05-22-2007
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	-
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 06/02/2015
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	-
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	Yes; Study Underway according to Essex County CAV Report
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	-
Does your floodplain management staff need any assistance or training to support its floodplain management program?	-
<input type="checkbox"/> If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	Class 10 - Rescinded (As of October 1, 2019 Flood Insurance Manual). Interested in rejoining.
How many flood insurance policies are in force in your jurisdiction?* <ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	NFIP policies: 304 Insurance in force: \$85,914,600 Premium in force: \$494,696
How many total loss claims have been filed in your jurisdiction?* <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Total loss claims: 215 Claims still open or closed without payment: 57 Total payments for losses: \$1,258,077.50
Do you maintain a list of properties that have been damaged by flooding?	Homeowners damaged by flooding are directed to FEMA.
Do you maintain a list of property owners interested in flood mitigation?	No

*According to FEMA statistics as of 03/31/19

ADDITIONAL AREAS OF EXISTING INTEGRATION

Planning Board: The Township of Montclair Planning Board is a land use board tasked with preparation of the Township Master Plan, review of Applications for Development for site plan and subdivision approval, make recommendations to the Township Council on any proposed changes to the land use ordinance, and grant conditional use or bulk variances in association with subdivision and site plan applications. The Planning Board is established under Montclair Code Chapter 202: Land Use Procedures, Article I: Planning Board.

Zoning Board of Adjustment: The Township of Montclair Zoning Board of Adjustment is a land use board empowered with principal duties to hear appeals, to grant variances from the strict application of the zoning ordinance and to rule on "use" applications. The Board consists of 7-members and 4-alternate members.

Development Review Committee: The purpose of the Development Review Committee is to review all site plan applications or requests for development review presented to the Planning Board and the Board of Adjustment.

Historic Preservation Commission: The Montclair Historic Preservation Commission (MHPC), established by ordinance in 1994, is responsible for protecting Montclair's architectural heritage and increasing public awareness of the





unique historical and cultural dimensions of the Township's buildings, streetscapes and landscapes. In accordance with the State Municipal Land Use Law, the commission surveys buildings, structures, objects, sites and districts located within the Township and researches and evaluates them for their historic significance.

Environmental Commission: The Montclair Environmental Commission (M.E.C.) was established by ordinance in 2001 (Ordinance No. 01-46), consistent with state laws creating environmental commissions. The role of the commission is to study, evaluate, and make recommendations to the Township Council and the Planning Board regarding local environmental issues, including (but not limited to) the following topics: solid waste management and recycling; clean water resources; stormwater management; energy conservation and renewable energy resources; air, noise, and light pollution; transportation and circulation planning; preservation and use of parks and other open spaces; land use; and protection of flora, fauna, soil and landscape throughout the Township. In addition, they review the potential effects of applications before the Planning and the Zoning Boards. The M.E.C. also provides environmental information to residents.

Department of Community Services/Public Works: The Department of Community Services is responsible for streets, public property and parks, refuse collection and recycling, shade tree maintenance, snow and leaf removal, and all community infrastructure except the parking and water utilities and sanitary sewers.

Department of Code Enforcement: The Division of Code Enforcement, Housing and Property Maintenance focuses on ensuring and improving the quality of life of all Montclair residents through enforcement of related provisions with the Code of the Township of Montclair, Essex County rules and regulations, and NJ Statewide requirements. The department works in tandem with many other departments, including Zoning, Construction, Health, Police and Fire.

Emergency Management: Emergency Management includes the Office of Emergency Management, Police Department, Fire Department Headquarters, Montclair Ambulance Unit, Montclair Health Department, and Hackensack UMC Mountainside Hospital.

Engineering Bureau: The Montclair Engineering Bureau is responsible for design and construction management for certain capital improvements to Township streets (curbs, paving and drainage/storm sewers) and parks. Other responsibilities of the Engineering Bureau include permitting and inspections for road openings and construction of sidewalk, curb and driveway aprons; maintenance of the official street map; and assistance to residents with engineering-related matters.

Environmental Affairs: The Office of Environmental Affairs is run by Montclair's Sustainability Officer, under direction of the Department of Health and Human Services. The Mission of this office is to: implement cost-saving energy reduction and waste prevention measures for the Township; provide information on environmental stewardship, public wellness, and economic responsibility to residents, schools, local businesses, and the municipal operations; and, as the liaison between the municipality and the Montclair Environmental Commission, to help create policies that protect our natural environment, the health and safety of residents, and the resilience of Montclair now and in the future.

Planning and Community Development: The Department of Planning and Community Development is responsible for all matters concerning planning, zoning, redevelopment and community development administration in the Township of Montclair.

Water Bureau and Sewer Utility: The Montclair Township Water Bureau and Sewer Utility provide customers with a safe, clean supply of drinking water and sanitary sewer disposal services at the lowest possible cost. This section of the township website is a convenient way for our customers to remain informed about the services we provide.



Sustainable Jersey: The Township is a bronze certified community in the Sustainable Jersey program. Actions connected to hazard mitigation that resulted in certification included:

- *Microgrid study:* In 2017, Montclair was awarded a \$142,000 grant from NJ Board of Public Utilities (NJBPU) for a Town Center Distributed Energy Resource (TCDER) Microgrid Feasibility Study, to determine whether Montclair would be an appropriate location for a Microgrid, to reduce energy costs through efficiency and provide resiliency and uninterrupted power for critical facilities during outages or disruption. The report, completed in 2018, has been reviewed by NJBPU for possible further incentives. It identifies Mountainside Hospital, Montclair Fire Headquarters and Emergency Management Center, Glenfield Middle School, our Water Bureau’s Glenfield Well, NJ Transit’s Bay Street Station, and Pine Ridge Senior Living housing complex as six facilities to be connected by the microgrid.
- *Complete Streets Program:* The Township’s Complete Streets Policy to be used in the planning, design, construction, maintenance and operation of all new or renovated roads and intersections within the township.
- *Tree Protection Ordinance:* The Township Council recognized in the Ordinance that “Trees and the urban forest are a valuable natural resource worthy of protection and conservation on a sustainable basis”, and, “The development of a mature and sustainable urban forest resource throughout the Township requires a comprehensive program for the management of the planting and removal of trees on public and private property.”

9.14.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Township of Montclair’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County; refer to Appendix E (Risk Assessment Supplement). Table 9.14-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.14-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	-

9.14.6 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 9.14-12 summarizes the Township of Montclair risk assessment results and data used to determine the hazard ranking. The following summarizes the hazards of greatest concern and risk to the Township of Montclair.



A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 9.14-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$3,966,255	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$22,012,264	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	0	NEHRP D&E:	0	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$4,134,051	
						2,500-year Loss:	\$69,557,125	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,678	Physical 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.		Low
		Population Below Poverty Level:	3,086					
Flood	100- and 500-Year Mean Return Period Event	100-year	1,281	100-year	289	100-year Loss:	\$6,252,388	High
		500-year	1,500	500-year	358			
Geological	High Landslide Susceptibility Areas	Class A:	41	Class A:	12	Class A:	10037036.91	Moderate
		Class B:	497	Class B:	140	Class B:	\$91,235,148	



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	39	Wildfire:	11	Wildfire:	\$10,591,516	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run-down.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power or water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Montclair.

- Number of repetitive loss (RL) properties: 21
Number of severe repetitive loss (SRL) properties: 0
Number of RL/SRL properties that have been mitigated: 0

Note: The number of SRL properties excludes RL properties. 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).

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.14-13. Potential Flood Losses to Critical Facilities and Lifelines

Table with 5 columns: Name, Type, Exposure (1% Event, 0.2% Event), Status of Mitigation. Rows include Montclair Volunteer Ambulance Unit*, City of Newark Chlorination Station*, Senior Care & Activities*, and Potable Water Well - Rand*.

* Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- There are 21 repetitive loss properties in the township.
Due to high intensity, short duration storms, vegetation and tree limbs fall bringing down power lines causing wide spread power outage.
Dam failure is a concern.
Montclair Volunteer Ambulance Unit at 95 Walnut Street is a critical facility and identified lifeline is located in the 1% Annual Chance Floodplain.
City of Newark Chlorination Station located at 782 Valley Road is a critical facility and identified lifeline is located in the 1% Annual Chance Floodplain.
Senior Care & Activities located at 110 Greenwood Avenue is a critical facility and identified lifeline is located in the 1% Annual Chance Floodplain.
A Potable Water Well – Rand located at North Fullerton Avenue and Chestnut Avenue is a critical facility and identified lifeline is located in the 1% Annual Chance Floodplain.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Montclair 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 Montclair has significant exposure. Figures 9.14-1 and 9.14-2 illustrate the Township of Montclair hazard area extent and locations. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 Montclair. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Montclair has reviewed the Essex 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 for flood from low to medium.
- The Township changed the hazard ranking for wildfire from low to medium.
- The Township changed the hazard ranking for cyber-attack from low to medium.
- The Township changed the hazard ranking for economic collapse from medium to low.
- The Township changed the hazard ranking for terrorism from low to medium.
- The Township changed the hazard ranking for transportation failure from low to medium.

Table 9.14-14. Township of Montclair Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Low	High	Medium	Medium



9.14.7 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 9.14-15. 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 #
Montclair-1: Obtain backup power to ensure continuity of operations. Obtain generators for Montclair critical facilities.	Township OEM	Complete; Town Hall and Ambulance Unit (Completed July 2018)		
Montclair-2: Obtain backup power to ensure continuity of operations. The following has been identified at this time: Township of Montclair ambulance station generator.	Township OEM	Complete; Town Hall and Ambulance Unit (Completed July 2018)		
Montclair-3: Conduct drainage improvements by adding culvert capacity to Parkside road crossing	Township Engineering	No Progress; Discontinue		
Montclair-4: Utility modification. Add storm drainage in areas where missing that experience localized flooding	Township Engineering	In Progress; Catch basins and head changed, underground infrastructure still lacking. Flooding continues	X	2020-Montclair-006
Montclair-5: 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 from FEMA and local match availability. Assess and prioritize non-structural flood hazard mitigation alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation	Township Manager	No Progress	X	2020-Montclair-007



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 #
depending on feasibility. The parameters for feasibility for this initiative would be: funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available. Specifically identified are properties in the following areas: •Nishuane Brook •Toneys Brook				
Montclair-6: 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: •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 (Facebook and Twitter) and email blast systems. •Posting of flyers and other readily available NFIP informational materials at Municipal Building offices. •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 grant opportunities, etc. which may include periodic articles and handouts.	Environmental Affairs	No Progress: Discontinue (Government Administration)		
Montclair-7: Develop and implement a post-event damage assessment program, including the following elements: •Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. •Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. •Develop an inventory (file system and/or database) of losses (incl. loss	Community Services	In Progress - Municipal Officials currently during NJOEM Damage Assessment Training	X	2020-Montclair-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 #
of service, property damage, economic losses, etc.) as reported to and/or identified by the Township (e.g. building permit process).				
Montclair-8: Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.	Building Department	No Progress; Discontinue		
Montclair-9: Request a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) if needed (part of the process of joining CRS, see above).	Engineering, FPA	No Progress; Discontinue		
Montclair-10: Have designated NFIP Floodplain Administrator (FPA) and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).	Engineering, FPA	No Progress; Discontinue		
Montclair-11: The Township will use the HMP as a guide when updating their Master Plan and incorporate findings as appropriate.	Township	Ongoing Capability		

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Montclair participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Montclair participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.



Table 9.14-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Montclair 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.14-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.14-18 summarizes the actions by type across hazards of concern.



Table 9.14-16. 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-Montclair-001	Develop and implement a post-event damage assessment program	The Township lacks a damage assessment program. Staff are currently beginning training.	Develop and implement a post-event damage assessment program, including the following elements: <ul style="list-style-type: none"> •Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. •Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. •Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Township (e.g. building permit process). 	N/A	All hazards	5	<u>Township of Montclair</u>	Municipal budget, NJOEM training	Assessment program created	High	3 years	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
2020-Montclair-002	Township microgrid	The Township is prone to utility failure. Critical infrastructure is prone to failure. The Township completed an assessment to complete	Acquire funding and implement microgrid according to specifications of previously completed assessment.	New and Existing	Severe Storm, Severe Winter Storm, Utility Interruption	2, 6	<u>Department of Community Services</u>	FEMA, HMGP	Power loss risk reduced	High	2 years	High	SIP	SP
2020-Montclair-003	Yantacow Brook Park Dam	Existing dam is failing and does not meet current DEP regulations. Dam failure could result in flooding and property damage.	The township will perform an engineering analysis to determine what repairs are necessary. The township will then perform the necessary repairs and improvements to bring the dam up to NJ DEP requirements.	Existing	Flood	2	<u>Department of Community Services</u>	NJ DEP, HMGP	Dam failure averted		TBD by engineering analysis	High	SIP	SP
2020-Montclair-004	Power line mitigation	Storms result in falling tree branches which can bring down power lines causing power loss.	Place utilities underground in identified problem areas, especially where utilities are located in rear yards and near critical facilities. In other areas, undergo tree trimming operations.	Existing	Severe Storm, Severe Winter Storm, Utility Interruption	2, 6	<u>Department of Community Affairs</u>	HMGP, PDM, CHIPS, PSEG	Reduction in power losses	\$3 million per mile of buried line, \$5,000 for tree trimming	1 year	High	SIP	PP
2020-Montclair-005	Emerald Ash Borer Infestation	Per surveying, a town wide infestation of emerald ash borer is worsening. As trees are infected, they are prone to losing branches and falling, leading to utility failure and property damages.	Perform an updated survey to determine which trees in the township are infected. Remove and treat infested trees.	N/A	Severe Storm, Severe Winter Storm, Utility Interruption	1, 2, 3	<u>Department of Community Services</u>	FEMA, HMGP, CHIPS	Reduction in utility interruptions	TBD by results of survey (extent of infestation)	3 years	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
2020-Montclair-006	Stormwater Upgrades	Areas of the township are prone to stormwater flooding	Continue to upgrade underground infrastructure	Existing	Flood, Severe Storm	2	<u>Township Engineering</u>	Municipal budget	Reduction in flooding	???	3 years	High	SIP	SP
2020-Montclair-007	Outreach to critical facilities	Montclair Volunteer Ambulance Unit at 95 Walnut Street, City of Newark Chlorination Station located at 782 Valley Road, Senior Care & Activities located at 110 Greenwood Avenue, and Potable Water Well – Rand located at North Fullerton Avenue and Chestnut Avenue are critical facilities and identified lifelines located in the 1% Annual Chance Floodplain.	The FPA will conduct outreach to facility managers to alert them of their exposure to flooding and possible mitigation actions.	Existing	Flood	2, 6	<u>FPA</u>	Municipal budget	Facility managers aware of risk and mitigation options	\$200	Within 1 year	High	EAP	PR
2020-Montclair-008	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages in the following areas: •Nishuane Brook •Toneys Brook These areas are residential, and these properties have been repetitively flooded as documented by paid NFIP claims.	Conduct outreach to flood-prone property owners, including RL property owners (21 RL) 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	Existing	Flood	1, 2, 3	<u>FPA</u> , 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.	\$3 million	3 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
			the areas that experience frequent flooding (high risk areas).											

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 9.14-17. 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-Montclair-001	Develop and implement a post-event damage assessment program	0	0	1	1	1	1	1	1	1	1	1	1	1	1	12	High
2020-Montclair-002	Township microgrid	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Montclair-003	Yantacow Brook Park Dam	0	1	1	1	0	1	1	0	1	0	0	1	1	1	9	High
2020-Montclair-004	Power line mitigation	0	1	1	1	1	1	0	0	1	1	1	0	1	1	10	High
2020-Montclair-005	Emerald Ash Borer Infestation	0	1	1	1	1	1	0	0	1	1	0	0	1	1	9	High
2020-Montclair-006	Stormwater Upgrades	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2020-Montclair-007	Outreach to critical facilities	1	1	1	1	1	0	1	1	1	1	0	1	1	1	12	High
2020-Montclair-008	Mitigate flood-prone properties, including RL/SRL properties	1	1	1	1	1	1	0	1	0	0	1	1	1	1	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.14-18. 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 Erosion and Sea Level Rise	2020-001							
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)	2020-001							
Drought	2020-001							
Earthquake	2020-001							
Extreme Temperature	2020-001							
Flood (riverine / flash flood, SLR)	2020-001, 2020-007	2020-008				2020-003, 2020-006		
Geological Hazards (landslides and subsidence/sinkholes)	2020-001							
Severe Weather (high wind, tornado, TSTM, and hail)	2020-001	2020-004		2020-005		2020-002		
Severe Winter Weather (heavy snow, blizzards, and ice storms)	2020-001	2020-004		2020-005		2020-002, 2020-006		
Wildfire	2020-001							
Civil Disorder	2020-001							
Cyber Attack	2020-001							
Disease Outbreak	2020-001							
Economic Collapse	2020-001							
Hazardous Substances	2020-001							
Utility Interruption	2020-001	2020-004		2020-005		2020-002		
Terrorism	2020-001							
Transportation Failure	2020-001							

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.14.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Montclair 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.14-19. Contributors to the Annex

Entity	Title	Method of Participation
Rob Bianco	Emergency Management Coordinator, Department of Community Services	Primary POC, Attended Plan Participant Meetings, contributed to the mitigation strategy, provided impact data
John Herrmann	Fire Chief/DEMC	Alternate POC, Attended Plan Participant Meetings, contributed to the mitigation strategy, provided impact data
Norberto Hernandez	Township Engineer	Floodplain Administrator



Figure 9.14-1. Township of Montclair Hazard Area Extent and Location Map

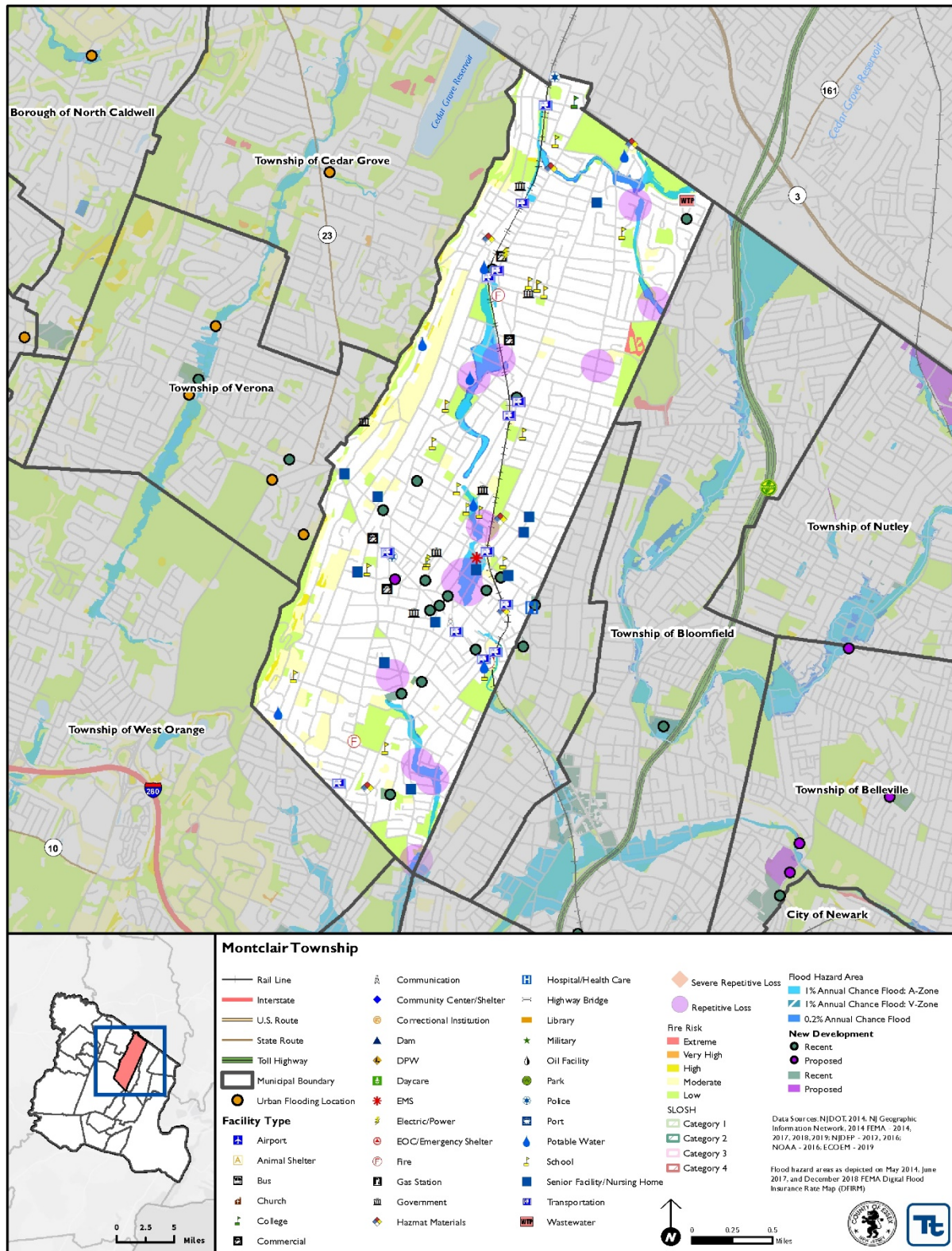
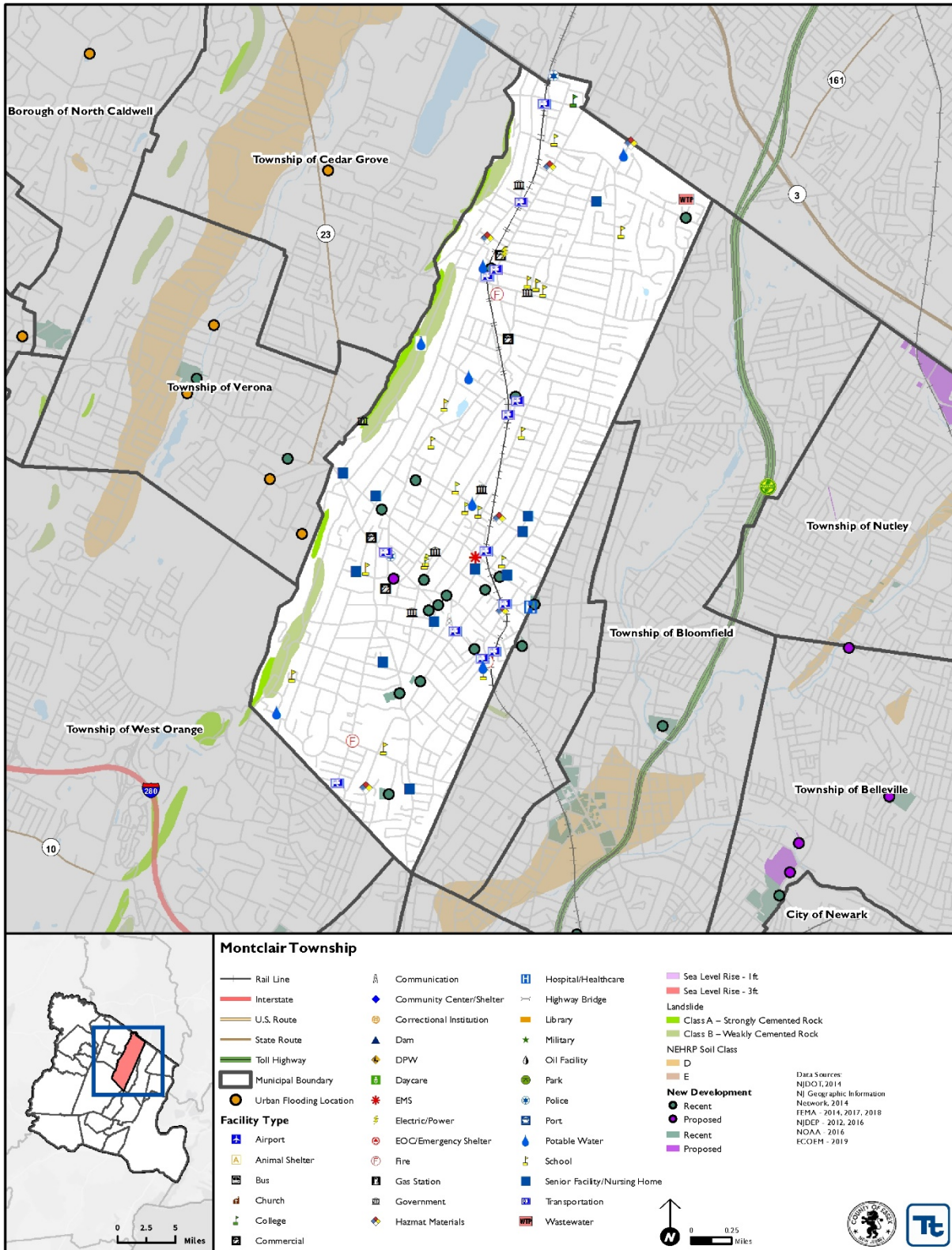




Figure 9.14-2. Township of Montclair Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of Montclair

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet			
Project Name:	Township microgrid		
Project Number:	2020-Montclair-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Utility Interruption		
Description of the Problem:	The Township is prone to utility failure. Critical infrastructure is prone to failure. The Township completed an assessment to complete		
Action or Project Intended for Implementation			
Description of the Solution:	Acquire funding and implement microgrid according to specifications of previously completed assessment.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Greatly reduces chance of power loss	Estimated Benefits (losses avoided):	Power loss risk reduced.
Useful Life:	25 years	Goals Met:	2, 6
Estimated Cost:	High	Mitigation Action Type:	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA, HMGP
Responsible Organization:	Department of Community Services	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
	Purchase mobile generators	\$30,000 per generator	Reliant on hookups
	Increase tree trimming to reduce chance of utility failure	\$50,000	Power loss still possible.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Township of Montclair

Name of Jurisdiction:

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet		
Project Name:	Township Micro-grid	
Project Number:	2020-Montclair-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Hardens utilities to critical infrastructure
Property Protection	1	Protects infrastructure
Cost-Effectiveness	1	
Technical	1	Assessment completed
Political	1	Political support
Legal	1	
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Storm, Utility Interruption
Timeline	1	Able to be completed as soon as funds are available
Agency Champion	1	Department of Community Services
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Montclair

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet			
Project Name:	Yantacow Brook Park Dam		
Project Number:	2020-Montclair-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Existing dam is failing and does not meet current DEP regulations. Dam failure could result in flooding and property damage.		
Action or Project Intended for Implementation			
Description of the Solution:	The township will perform an engineering analysis to determine what repairs are necessary. The township will then perform the necessary repairs and improvements to bring the dam up to NJ DEP requirements.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	NJ DEP standards	Estimated Benefits (losses avoided):	Dam failure averted
Useful Life:	50 years	Goals Met:	2
Estimated Cost:	TBD by engineering analysis	Mitigation Action Type:	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	To be completed as soon as funding is available
Estimated Time Required for Project Implementation:	TBD by engineering analysis	Potential Funding Sources:	NJ DEP, HMGP
Responsible Organization:	Department of Community Services	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
	Remove dam	N/A	Dam cannot be removed as it would increase flooding
	Build new dam upstream	N/A	Building a new dam upstream is not feasible due to property ownership
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Township of Montclair

Name of Jurisdiction:

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet		
Project Name:	Yantacow Brook Park Dam	
Project Number:	2020-Montclair-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Protects property from dam failure
Cost-Effectiveness	1	
Technical	1	Technical support likely to be provided by NJ DEP
Political	0	
Legal	1	Mandated by NJ DEP
Fiscal	1	
Environmental	0	
Social	1	
Administrative	0	
Multi-Hazard	0	Flood
Timeline	1	
Agency Champion	1	Department of Community Services
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Montclair

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet			
Project Name:	Power line mitigation		
Project Number:	2020-Montclair-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Utility Interruption		
Description of the Problem:	Storms result in falling tree branches which can bring down power lines causing power loss.		
Action or Project Intended for Implementation			
Description of the Solution:	Place utilities underground in identified problem areas, especially where utilities are located in rear yards and near critical facilities. In other areas, undergo tree trimming operations.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Reduction in power losses	Estimated Benefits (losses avoided):	Reduction in power losses
Useful Life:	5 years for tree trimming. 50 years for burying of utility lines.	Goals Met:	2, 6
Estimated Cost:	\$3 million per mile of buried line, \$5,000 for tree trimming	Mitigation Action Type:	Structure and infrastructure Projects
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	HMGP, PDM, CHIPS, PSEG
Responsible Organization:	Department of Community Affairs	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
	Ask residents to alert township to dangerous trees.	\$1,000	Reactive. Likely to miss most trees.
	Remove all trees along areas with powerlines and property	N/A	Not feasible/environmentally damaging
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			



Update Evaluation of the Problem and/or Solution:

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Township of Montclair

Name of Jurisdiction:

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet		
Project Name:	Power line mitigation	
Project Number:	2020-Montclair-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Project will protect utilities from falling tree damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to conduct the project
Fiscal	0	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Storm, Utility Interruption
Timeline	0	
Agency Champion	1	Department of Community Affairs
Other Community Objectives	1	Restore natural floodplain function
Total	10	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Montclair

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet			
Project Name:	Emerald Ash Borer Infestation		
Project Number:	2020-Montclair-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Utility Failure		
Description of the Problem:	Per surveying, a town wide infestation of emerald ash borer is worsening. As trees are infected, they are prone to losing branches and falling, leading to utility failure and property damages.		
Action or Project Intended for Implementation			
Description of the Solution:	Perform an updated survey to determine which trees in the township are infected. Remove and treat infested trees.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Removal/treatment of infected trees	Estimated Benefits (losses avoided):	Reduction in utility interruptions
Useful Life:	10 years	Goals Met:	1, 2, 3
Estimated Cost:	TBD by results of survey (extent of infestation)	Mitigation Action Type:	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months
Estimated Time Required for Project Implementation:	3 years	Potential Funding Sources:	FEMA, HMGP, CHIPS
Responsible Organization:	Department of Community Services	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
	Ask residents to alert village to dangerous trees.	\$1,000	Reactive. Likely to miss most trees.
	Remove all trees along areas with powerlines and property	N/A	Not feasible/environmentally damaging
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Township of Montclair

Name of Jurisdiction:

Name and Title Completing Worksheet: John Herrmann, Fire Chief

Action Worksheet		
Project Name:	Emerald Ash Borer Infestation	
Project Number:	2020-Montclair-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Project will protect properties from falling tree damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The township has the legal authority to conduct the project
Fiscal	0	Project requires funding support
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	
Agency Champion	1	Department of Community Services
Other Community Objectives	1	Restore natural floodplain function
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Montclair

Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Montclair-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the following areas: •Nishuane Brook •Toneys Brook These areas are 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 flood-prone property owners, including RL property owners (21 RL) 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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard <i>(in accordance with flood ordinance)</i>	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, 3
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:

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Township of Montclair

Name of Jurisdiction:

Name and Title Completing

Worksheet:

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Montclair-007	
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 flood prone area of Town.
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	



CITY OF NEWARK

MUNICIPALITY AT A GLANCE

Total Population: **282,803**
 Total Land Area: **26.2 sq mi**
 Total # Buildings: **43,085**



1% Annual Chance Flood



16,688

Population Residing
in Floodplain



988

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$21 Million

Potential Building Damages



\$1.3 Billion

Potential
Building Damages



29

Critical Facilities
in Floodplain

NFIP Statistics



198 # NFIP
Policies

21 # RL NFIP
Properties

0 # SRL NFIP
Properties

Hurricane Storm Surge: Category 1



14,793

Population Located
in Category 1 SLOSH



2,173

Buildings Located
in Category 1 SLOSH

Mitigation Action Plan (2020-2025)



Hazards

All Natural and
Non-Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resource
Protection, Emergency Services, Structural
Projects, Community Capacity Building

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9.15 CITY OF NEWARK

This section presents the jurisdictional annex for the City of Newark. The annex includes a general overview of the City of Newark; an assessment of the City of Newark’s risk and vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to hazards.

9.15.2 Hazard Mitigation Planning Team

The following individuals are the City of Newark’s identified hazard mitigation plan 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: Dorian Herrell, OEM Coordinator Address: 480 Clinton Ave, Rm 307, Newark, NJ 07108 Phone Number: 973-877-9262 Email: herrelld@ci.newark.nj.us	Name / Title: Juba Dowdell, OEM Deputy Coordinator Address: 480 Clinton Ave, Rm 307, Newark, NJ 07108 Phone Number: 973-877-9260 Email: dowdellj@ci.newark.nj.us
NFIP Floodplain Administrator	
Name / Title: Phil Scott, Director of the Engineering Department Address: 920 Broad St., Room 412, Newark, NJ 07102 Phone Number: 973-733-8520 Email: scottp@ci.newark.nj.us	

9.15.3 Jurisdiction Profile

The City of Newark is located West of Manhattan, South of Belleville, and East of East Orange along the Newark Bay. Both Newark Liberty International Airport and the Port of Elizabeth are located South and East of Newark (City of Newark New Jersey, 2014).

On April 11, 1836 Newark was incorporated as a City but its origin dates back to the Newark Tract in October 1693. Newark’s Branch Brook Park is the oldest County park in the country and is home to the largest collection of cherry blossom trees in the country. The 1967 Newark Riots were a result of urban decline experienced in the city during the early 20th Century. Newark has experienced a revitalization since the late 20th Century and early 21st Century (City of Newark New Jersey, 2014).

According to the U.S. Census, the 2010 population for the City of Newark was 277,140. The estimated 2017 population was 282,803, which is a 2 percent increase in population from 2010. Data from the 2017 U.S. Census American Community Survey estimates that 7.5 percent of the City population is five years of age or younger, and 9.7 percent is 65 years of age or older. 8 percent of the population is estimated to be below the poverty line. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

Since the 1950’s, the City of Newark has operated using the Mayor-Council for of government. The Council includes nine (9) members who serve five (5) year terms. Five (5) members are elected at large and four (4) are elected by the wards the individuals represent (City of Newark New Jersey, 2014).



9.15.4 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. Refer to Figure 9.15-1 and 9.15-2 at the end of this annex which illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

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	8	0	0	2	0
Multi-Family	38	37	45	48	50
Other (commercial, mixed-use, etc.)	27	12	21	43	18
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					
10 Central Avenue	Residential	41	10 Central Ave, Newark, NJ 07102	None	Construction
60 Somerset Street	Residential	15	60 Somerset St, Newark, NJ 07103	NEHRP Soil Class D	Construction
50 Barclay Street	Residential	15	50 Barclay St, Newark, NJ 07103	NEHRP Soil Class D	Construction
35 Somerset Street	Residential	15	35 Somerset St, Newark, NJ 07103	NEHRP Soil Class D	Construction
25 Somerset Street	Residential	15	25 Somerset St, Newark, NJ 07103	NEHRP Soil Class D	Construction
505 Clinton Avenue	Residential	27	505 Clinton Ave, Newark, NJ 07108	None	Construction
141-145 NJRR Ave	Residential	32	141-145 NJRR Ave, Newark, NJ 07105	None	Construction
495-505 Washington St	Residential	34	494-505 Washington St, Newark, NJ 07102	None	Construction
4 Spring St	Residential	84	4 Spring Street, Newark, NJ 07104	500 year flood zone, NEHRP Soil Class D	Built
98 Clinton Ave	Residential	13	98 Clinton Ave, Newark, NJ 07114	None	Permit



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
145 Thomas St	Residential	3	145 Thomas St, Newark, NJ 07114	None	Built
80 Montclair St	Residential	3	80 Montclair Avenue, NJ 07104	NEHRP Soil Class D	Construction
578-580 S. 11 th St	Residential	3	578-580 S. 11 th Street, Newark, NJ 07103	None	Construction
230 Dr. Martin Luther King Blvd	Residential	4	230 Dr. Martin Luther King Jr Boulevard, Newark, NJ 07102	None	Built
58-60 Elm St	Residential	30	58-60 Elm Street, Newark, NJ 07105	100 year floodplain, NEHRP Soil Class D	Built
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
225-239 McWhorter St	Residential	46	225-239 McWhorter St, Newark, NJ 07105	100 year floodplain, NEHRP Soil Class D	Permit
1057 Bergen St	Residential	10	1057 Bergen Street, Newark, NJ 07112	None	Construction
915 Broad St	Residential	84	145 Thomas St, Newark, NJ 07114	NEHRP Soil Class D	Construction
96-112 Main St	Residential	60	96-112 Main Street, Newark, NJ 07105	NEHRP Soil Class D	Construction
100 Polk St	Residential	42	100 Polk Street, Newark, NJ 07105	100 year floodplain, NEHRP Soil Class D	Construction
1041 Bergen St	Residential	32	1041 Bergen Street, Newark, NJ 07112	None	Construction
195-197 Lincoln Ave	Residential	15	195-197 Lincoln Avenue, Newark., NJ 07104	None	Permit
437-451 Mulberry St	Residential	22	437-451 Mulberry St, Newark, NJ 07114	100 year floodplain, NEHRP Soil Class D	Construction
364 N. 10 th St	Residential	2	264 N. 10 th Street, Newark, NJ 07107	None	Construction



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
90 Chelsea Ave	Residential	2	90 Chelsea Avenue, Newark, NJ 07107	None	Construction
282 Broad St	Residential	2	282 Broad Street, Newark, NJ 07104	NEHRP Soil Class D	Permit
576 S. 11 th St	Residential	3	576 S. 11 th Street, Newark, NJ 07103	None	Construction
25-27 Garibaldi Ave	Residential	3	25-27 Garibaldi Avenue, Newark, NJ 07114	100 year floodplain, NEHRP Soil Class D	Permit
29 Garibaldi Ave	Residential	3	29 Garibaldi Avenue, Newark, NJ 07114	100 year floodplain, NEHRP Soil Class D	Permit
31 Garibaldi Ave	Residential	3	31 Garibaldi Avenue, Newark, NJ 07104	100 year floodplain, NEHRP Soil Class D	Permit
35 Garibaldi Ave	Residential	3	35 Garibaldi Avenue, Newark, NJ 07114	100 year floodplain, NEHRP Soil Class D	Permit
682-684 S. 19 th Ave	Residential	3	682-684 S. 19 th Avenue, Newark, NJ 07103	None	Permit
572-574 S. 11 th St	Residential	3	572-574 S. 11 th Street, Newark, NJ 07103	100 year floodplain, NEHRP Soil Class D	Permit
73-87 4 th Ave	Residential	18	73-87 4 th Avenue, Newark, NJ 07104	None	Permit
66-72 Dr. Martin Luther King Jr Blvd	Residential	10	68-72 Dr. Martin Luther King Jr Boulevard, Newark, NJ 07104	None	Construction

* Only location-specific hazard zones or vulnerabilities identified.



9.15.5 Capability Assessment

The City of Newark performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. 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 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 Newark.

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 and State	Yes	No	2020-Newark-013, 2020-Newark-016
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Ord. 6 S+FH, 4-19-06 § 1. Administered by Engineering. The city could include additional standards for stormwater components.</i>					
Zoning Code	Yes	Local and State	Yes	No	2020-Newark-013, 2020-Newark-016
<i>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. R.O. 1966 C.S. § 27:1-1[a], Zoning Regulations Ordinance Title 40. Updated 2014. Administered by Economic and Housing Development.</i>					
Subdivisions	Yes	Local and State	Yes	No	2020-Newark-013, 2020-Newark-016
<i>Comment: 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. Ord. 6 S+FB, 2-17-82 § 1.1, Land Use Subdivision Ordinance Title 38. Administered by Economic and Housing Development.</i>					
Stormwater Management	Yes	Local	Yes	No	2020-Newark-015
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Adopted 9/9/2012, Ord. Title 38; Ord. 6 PSF-A, 9-19-12, Sewers and Sewage Disposal Title 32; Land Use Subdivision Title 37:10-47. Administered by Water and Sewer.</i>					
Post-Disaster Recovery	No	-	-	No	-
<i>Comment:</i>					



	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 #.
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
<i>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.</i>					
Growth Management	No	-	Yes	No	-
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	No	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	-
<i>Comment: N.J.S.A. 40:55D-1 et. Seq., Municipal Land Use Law. Ch. 38 – Land Use Procedures. Administered by Engineering.</i>					
Environmental Protection	No	-	Yes	No	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	No	2020-Newark-016
<i>Comment: Adopted 2007, Ord. 6 S+FA (S-1), 6-1-07 § 1. Administered by Engineering.</i>					
Wellhead Protection	No	-	-	No	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: No Ord. - Revised every 10 years with a periodic re-examination. Administered by Economic and Housing Development.</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>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. No Ord. - Annual revision by Department Directors. Administered by Engineering.</i>					



	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 #.
Disaster Debris Management Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Floodplain or Watershed Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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).</i>					
Stormwater Pollution Prevention Plan	No	Local and State	Yes	Yes/No	Yes/No
<i>Comment:</i>					
Urban Water Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Economic Development Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment: No Ord. - Revision by Department Director</i>					
Shoreline Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Transportation Plan	In development	Local	No	Yes/No	Yes/No
<i>Comment: Working on downtown circulation study, into other wards as well. Doesn't currently incorporate evacuation or emergency planning.</i>					
Agriculture Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Climate Action Plan	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Draft Sustainability Action Plan 2020.</i>					
Tourism Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Business Development Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					



	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 #.
Other	Yes	Local, Federal	Yes/No	Yes/No	Yes/No
<i>Comment: Redevelopment Plans. Administered by City. Passaic River Tidal Protection Area, New Jersey Coastal Storm Risk Management Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment. Administered by USACE. Draft from May 2018.</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>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. Updated 2018 - No Ord.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	Yes	Local	No	-	-
<i>Comment: Post-Disaster Redevelopment Plan. 2015.</i>					
Continuity of Operations Plan	Yes	Local	No	-	-
<i>Comment:</i>					
Public Health Plan	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					

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, through the Office of Planning and Zoning
Does your jurisdiction have the ability to track permits by hazard area?	Yes, through Property Management
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, through Property Management

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the City of Newark.



Table 9.15-5. 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	Yes	Open Space Trust Fund operates with a board
Economic Development Commission / Committee	Yes	Department of Economic and Housing Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	CodeRed, City website, Dep of Public Safety Website, Facebook, Social Media, Reverse 911, Message Boards
Maintenance program to reduce risk	Yes	Stormwater maintenance, tree trimming
Mutual aid agreements	Yes	Police and Fire with Essex County and State OEM
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering, Economic and Housing Development
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering
Planners or engineers with an understanding of natural hazards	Yes	Engineering, Economic and Housing Development
Staff with training in benefit/cost analysis	Yes	Engineering, Economic and Housing Development, Administration
Surveyors	Yes	Engineering
Personnel skilled or trained in GIS applications	Yes	Engineering, Economic and Housing Development, Office of Management and Budget
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Newark OEM
Grant writers	Yes	Economic and Housing Development, Administration
Resilience Officer	No	-
Other	Yes	Sustainability Officer

FISCAL CAPABILITY

The table below summarizes financial resources available to the City of Newark.

Table 9.15-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes - Administration
Capital Improvements Project Funding	Yes - Administration
Authority to Levy Taxes for Specific Purposes	Yes - Administration, Office of Partnerships and Grants Management
User Fees for Water, Sewer, Gas or Electric Service	Yes - Water & Sewer Utilities
Incur Debt through General Obligation Bonds	Yes - Administration, Department of Finance



Incur Debt through Special Tax Bonds	Yes - Administration, Office of Special Taxes ex. Rental Car Tax
Incur Debt through Private Activity Bonds	Administration, Department of Finance
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes - Administration, Economic and Housing Development, OEM
Development Impact Fees for Homebuyers or Developers	Yes, Administration, City Surveyor's Office
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the City of Newark.

Table 9.15-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Department of Public Safety
Do you have personnel skilled or trained in website development?	Yes, though the Office of Emergency Management needs an additional IT person to be more efficient.
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes, the Department of Public Safety page hosts information on all hazards impacting the City.
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes, the City uses Facebook and Instagram.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Environmental Commission
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes, the City can utilize the following to communicate hazard-related information: CodeRed, City website, Dep of Public Safety Website, Facebook, Social Media, Reverse 911, Message Boards
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes, the City can utilize the following to communicate warnings during hazard events: CodeRed, City website, Dep of Public Safety Website, Facebook, Social Media, Reverse 911, Message Boards

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the City of Newark.

Table 9.15-8. 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	2011
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainability Jersey	Yes	None	1/05/2011

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 referred to while discussing climate change adaptation; however, it also provides 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.

Table 9.15-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	High
Drought	Medium
Earthquake	Medium
Extreme Temperature	High
Flood	Medium
Geological Hazards	Low
Severe Weather	High
Winter Storm	High
Wildfire	Low
Civil Disorder	Medium
Cyber Attack	Low
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	High
Terrorism	Medium
Transportation Failure	Low

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?	Engineering Department
Who is your floodplain administrator? (name, department/position)	Phillip Scott, Director of the Engineering Department
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	March 23, 1980
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meet



Criterion	Response
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC-9/21/15; no CAV
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	Yes, FIRM Update after the PFIRM was appealed and the RiskMAP process was restarted. The current FIRM is from 2007.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	The City felt the PFIRMs overstated flood risk in the City.
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
<input type="checkbox"/> If so, what type of assistance/training is needed?	City staff would appreciate any floodplain management training opportunities.
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	The City does not participate in the CRS program. Costs of the program have kept the City from applying in the past but the City is interested in joining.
How many flood insurance policies are in force in your jurisdiction?*	Policies: 205
<ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Insurance in force: \$91,922,800 Total premiums: \$560,639
How many total loss claims have been filed in your jurisdiction?*	Total loss claims: 287
<ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Open claims: 84 Total payments: \$18,131,114.62
Do you maintain a list of properties that have been damaged by flooding?	Individual departments have listing of properties but no master list.
Do you maintain a list of property owners interested in flood mitigation?	No official list but have the ability to get the word out through community groups.

*According to FEMA statistics as of March 31, 2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

- Department of Public Safety:** The creation of the Department of Public Safety consolidated the Police Division, Fire Division, and the Office of Emergency Management and Homeland Security. The consolidation has also resulted in the creation of a Communications Division. The operating budget for the Department of Public Safety is in excess of \$200 million a year and is staffed more than 1,900 employees, with more than 990 sworn Police Officers and over 630 sworn firefighters.
 - The Police Division is entrusted to protect and serve the citizens of the City of Newark by securing neighborhoods, business districts, municipal assets and life, liberty and property. The Police Division currently responds to more than 520, 000 calls for service yearly.
 - The Fire Division is also tasked with protecting the lives and property of the citizens of the City of Newark. They accomplish this by fighting fires and responding to sudden medical emergencies and exposure to dangerous conditions whether natural or man-made. Each year, the Fire Division responds to over 16,720 calls for service.
 - The Division of Emergency Management and Homeland Security (OEM) is responsible for coordinating training, preparedness and response to man-made and natural disasters. These events include blizzards, hurricanes, extreme heat, acts of terrorism and special events. The Division of OEM works with its public and private partners to accomplish this goal.



- The Communications Division unifies 911 calls and responses, as well as internal operational communication between the Police, Fire Divisions and OEM when necessary. The 911-call center handles approximately 960,000 emergency and non-emergency calls per year
- **Economic and Housing Development:** The mission of the Department of Economic and Housing Development is to create economic opportunity for Newark residents and enhance the vibrancy of our city. To this end, the department seeks to position Newark to take advantage of its unique assets, including its strategic location, a diverse and underutilized workforce, a large amount of developable land, concentration of corporate and business service firms, several major universities, and a wealth of arts and cultural assets.
- **Department of Engineering:** The Department of Engineering prepares, maintains, operates and repairs the City of Newark's infrastructures. This department is responsible for improvements and enhancements including: roadways, traffic and transportation, municipal parks, and the issuance of all construction permits. Through strategic planning and quality management, the department ensures that facilities provide citizens favorable and safe living conditions, conserving energy and improving the quality of lives. The department consists of the following divisions:
 - Building Division (UCC)
 - Code Enforcement
 - Traffic and Signals
- **Department of Public Works:** The Department of Public Works provides comprehensive services for the City's garbage collection, parks, buildings, vehicles, and properties. The Department was created by Mayor Baraka in 2016 from the consolidation of divisions from the Departments of Engineering, and Neighborhood and Recreational Services.
- **Department of Water and Sewer Utilities:** The Department of Water and Sewer Utilities' mission is to serve a continuous supply of safe, high quality and good tasting water for the City of Newark. The department works to protect the utility investments by ensuring and maintaining the integrity and security of the City of Newark's water and sewer infrastructure.
- **Newark Community Economic Development Corporation:** Newark Community Economic Development Corporation (NCEDC) is the primary economic development catalyst for Newark. It is organized to retain, attract and grow businesses, enhance small and minority business capacity, and spur real estate development throughout the city's 20 diverse neighborhoods.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.
- **Coastal Vulnerability Assessment; Newark City Riverfront:** The City of Newark underwent a Coastal Vulnerability Assessment in 2017 (<https://www.nj.gov/dep/bcrp/docs/cva/newark-riverfront-cva-final-05-2017.pdf>). The report aimed to assess vulnerabilities to enable the city in the planning for future exposures and develop strategies for mitigating long-term risk, making the city more resilient. To do so, the report assessed community vulnerability to sea level rise projected for the year 2050 along with a category 1 hurricane storm surge. Funding for this project was provided by the U.S. Department of the Interior and



administered by the National Fish and Wildlife Foundation as part of the Hurricane Sandy Coastal Resiliency Competitive Grant Program. The report identified connections to the 2016 Essex County Hazard Mitigation Plan and reinforced the following actions from the HMP:

- Along the Passaic Riverfront, the city can mitigate flooding and damage to property through Green Infrastructure Implementation. Creating a buffer of vegetation between the Passaic River and inland development.
- Passaic River Acquisition
- Stormwater management through green infrastructure

The report identified the following recommendations:

- Consider site remediation that also includes stormwater management
 - Where applicable, consider shoreline stabilization and restoration projects
 - Conduct a repetitive loss area analysis (RLAA)
- **Lead Service Line Replacement Program:** The City of Newark is committed to provide clean, safe and reliable drinking water to all Newark residents. To support this mission, the city has developed the Information About Lead Program. The program consists of a series of actions that Newark is undertaking to reduce or eliminate lead in drinking water at the customer’s tap. The program also aims to educate the public on actions they can take to reduce their exposure to lead in drinking water.
 - **Green Infrastructure:** The City of Newark is building green infrastructure into streetscape design.
 - **Resiliency Studies:** The City of Newark has completed a Strategic Recovery Planning Report. The Ironbound Community went through a version of the NJ DEP’s Getting to Resilience Process. The City of Newark is a participant in the NJ DEP Resilient New Jersey grant program. The program will provide funding and technical assistance to multi-municipal regions within New Jersey’s nine Most Impacted and Distressed counties affected by Superstorm Sandy to undertake a comprehensive planning process. This program will assist municipalities to identify and address vulnerabilities to increased coastal and riverine flood risk and other climate stressors.

9.15.6 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Volume I, Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles (Section 4.4) and includes a chronology of events that have affected Essex County and its jurisdictions. The City of Newark’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.15-11 provides details regarding municipal-specific loss and damages the City experienced during hazard events from 2014 to 2019. 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)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard; DR-4264	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and	Many trees were down and the airport was closed. Major highways and corridors were shut down.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			<p>blizzard conditions to the urban corridor and some nearby areas.</p> <p>Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. Bridges and tunnels from New York City into New Jersey were shut down by mid-afternoon Saturday.</p> <p>More than 1,000 flights out of area airports were cancelled, and Teterboro Airport were shuttered due to whiteout conditions. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.</p>	
August 19, 2016	Bus Crash	N/A	Two buses collided at the intersection of North Broad Street and Raymond Boulevard.	One bus driver and a passenger were killed. 18 people were injured. Six people were critically injured.
January 12, 2018	Utility Failure	N/A	Weather resulted in power outages across New Jersey	A transformer caught fire under a terminal at Newark Liberty International Airport, prompting an evacuation of the concourse and the use of backup generators.
October 20, 2018	Utility Failure	N/A	An underground transformer fire resulted in a widespread power outage in downtown Newark	City Hall was without power for 36 hours until a portable generator could be installed.
November 15, 2018	Winter Storm	N/A	<p>Moisture associated with a trough and low pressure was able to produce moderate to heavy bands of snow as the precipitation began across the entire Tri-State area due to the cold air in place. The moderate to heavy wet snowfall significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, which caused many power outages. Numerous accidents were reported and many motorists were stranded on roads until the early morning hours the next day. There were over 1,000 flights cancelled at the New York City</p>	<p>Many trees were down and the airport was closed. Major highways and corridors were shut down. The snow resulted in numerous accidents including emergency vehicles which were out to do emergency response.</p>



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			metro airports (Kennedy, La Guardia, and Newark). The FAA contract observer at nearby Newark Airport reported 6.4 inches of snow. Impacts were widely felt across eastern Essex county with major disruption to the evening commute.	

Notes:

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. Table 9.15-12 summarizes the risk assessment results used to inform the City of Newark hazard ranking. 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 City of Newark.

- Number of repetitive loss (RL) properties: 21
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

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).



Table 9.15-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	270	CEHA:	42	CEHA:	\$42,317,146	High
		SLR +1ft:	28	SLR +1ft:	8	SLR +1ft:	\$18,754,730	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	251	SLR +3ft:	43	SLR +3ft:	\$68,375,036	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	14,793	Category 1:	2,173	100-year Wind Loss:	\$21,018,601	High
		Category 2:	44,505	Category 2:	6,352			
	Category 1 through Category 4 SLOSH	Category 3:	63,077	Category 3:	8,953	500-year Wind Loss:	\$159,024,073	
		Category 4:	69,865	Category 4:	9,773			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	82,555	NEHRP D&E:	11,579	100-year Loss:	\$1,195,466	High
		Liquefaction Class 4:	6,610	Liquefaction Class 4:	1,091	500-year Loss:	\$86,036,956	
						2,500-year Loss:	\$1,213,542,653	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	27,341	Physical 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.		Low
		Population Below Poverty Level:	79,010					
Flood	100- and 500-Year Mean Return Period Event	100-year	16,688	100-year	2,411	100-year Loss:	\$1,337,220,168	High
		500-year	32,935	500-year	4,691			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	139	Wildfire:	13	Wildfire:	\$13,311,804	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County; Newark has 4	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2



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

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Newark Liberty International Airport	Airport	X	X	2020-Newark-017
Central Maintenance Facility	Bus	X	X	2020-Newark-017
Newark Penn Station*	Bus		X	2020-Newark-017
Elan Chemical Company	Chemical Storage	X	X	2020-Newark-017
General Chemical Newark Plant Warf	Chemical Storage	X	X	2020-Newark-017
Messenger Trucking And Warehouse Corp.	Chemical Storage	X	X	2020-Newark-017
Essex County Correctional Facility	Correctional Institution	X	X	2020-Newark-017
Northern State Prison	Correctional Institution	X	X	2020-Newark-017
American Fuel Company of Essex	Electric Power	X	X	2020-Newark-017
Propane Power Corp.	Electric Power	X	X	2020-Newark-017
PSE&G Generating Station*	Electric Power	X	X	2020-Newark-017
Newark Fire Department Engine 14*	Fire	X	X	2020-Newark-017
Newark Fire Department Engine 19*	Fire		X	2020-Newark-017
ECSO Bureau of Narcotics	Government		X	2020-Newark-017
Bridge Street	Highway Bridge	X	X	2020-Newark-017
Clay Street	Highway Bridge	X	X	2020-Newark-017
Newark Penn Station	Light Rail		X	2020-Newark-017
Pennington Court	Newark Housing Authority	X	X	2020-Newark-017
Riverside Villa	Newark Housing Authority	X	X	2020-Newark-017
Seth Boyden Terrace	Newark Housing Authority		X	2020-Newark-017
Amerada Hess - Doremus Terminal	Oil Facility	X	X	2020-Newark-017
G J Chemical Company Incorporated	Oil Facility	X	X	2020-Newark-017
Getty Terminals Corporation	Oil Facility	X	X	2020-Newark-017
Sun Oil Pipe Line Company Newark Terminal	Oil Facility	X	X	2020-Newark-017
New Jersey State Police Troop D - Newark Station*	Police		X	2020-Newark-017
New Jersey Transit Police Department*	Police	X	X	2020-Newark-017
USCBP - Newark Inspection Site*	Police	X	X	2020-Newark-017
Port Newark Channel	Port	X	X	2020-Newark-017
Port Newark Marine Facility 1	Port	X	X	2020-Newark-017
Port Newark Marine Facility 2	Port	X	X	2020-Newark-017
Port Newark Marine Facility 3	Port	X	X	2020-Newark-017
East Side High School*	School		X	2020-Newark-017
Oliver Street Elementary School	School		X	2020-Newark-017
South Street Elementary School	School		X	2020-Newark-017
Waverly Elementary School	School	X	X	2020-Newark-017
Wilson Avenue Elementary School	School		X	2020-Newark-017
Newark Airport*	Train Station	X	X	2020-Newark-017
Passaic Valley Sewerage Commission*	Wastewater Treatment Plant	X	X	2020-Newark-017
Pvsc Newark Secondary Wastewater Treatment Plant*	Wastewater Treatment Plant	X	X	2020-Newark-017

Note:





*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the additional following vulnerabilities within their community:

- The East Ward has reoccurring flooding issues.
- Frelinghuysen Avenue to the west of the airport has reoccurring flooding issues.
- The city has 21 repetitive loss properties
- OEM needs additional IT support/staff to ensure they are able to get messages out quickly and update educational information on their website, social media, etc. in a timely manner.
- Catch basins are clogged.
- Extreme Temperatures may result in power loss and cause increased risk to human life. Homeless and other populations lack resources to protect themselves.
- The area adjacent to the Clay Street combined sewerage outfall is prone to flooding, usually during times of rainfall and high tide.
- It is unknown if filtration stations for potable water have capacity to filter out microcystin from possible harmful algal blooms which have become more common in the region.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the City of Newark 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 considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the City of Newark has significant exposure; refer to Figures 9.15-1 and 9.15-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as 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 Essex 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 for the City of Newark. During the review of the calculated hazard ranking, the City adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The City of Newark has reviewed the 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 of coastal storm from high to medium.
- The City changed the risk ranking of civil disorder from low to medium.
- The City changed the risk ranking of disease outbreak from low to medium.
- The City changed the risk ranking of hazardous substances from low to medium.
- The City changed the risk ranking of terrorism from low to medium.



Table 9.15-14. City of Newark Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Medium	Medium	Medium	High	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Medium	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Medium	Medium	Medium	High	Medium	Low

9.15.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their 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 9.15-15. 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 #
Newark-1: McClellan St. stormwater pumping station - Project is still currently under design and will be entering construction in 2015. Project includes widening of the roadway under installation of a new drainage system and a pump	Newark Engineering	In progress Working with the NJ DOT to finalize design plans and execute new cost reimbursement agreement.	X	2020-Newark-004
Newark-2: Meadowland stormwater pumping station and emergency power supply—Installation of emergency backup electric generators so the pump station can remain operational during power outages to prevent flooding at Newark Airport and the low lying areas of the East and South Wards during hurricanes and/or heavy rain events	Newark Engineering	In progress Currently under construction, switch upgrade to be completed by Port Authority with a small cost share. Various upgrades to Newark’s Meadowlands stormwater pump station is expected to be in service in 2020.	X	2020-Newark-005
Newark-3: Peddie St. outfall improvements – Replacement of undersized failing netting facility and the removal of sediment from the Peddie Ditch that cause impediments that restrict the flow of water in the existing pipe.	Newark Engineering	In progress	X	2020-Newark-006
Newark-4: Frelinghuysen/Empire/Meeker St. stormwater improvements - This project would remove that blockage and restore capacity of the Queen Ditch so the existing Queen Street Outfall, and the connected upstream sewers, can drain and provide storm water conveyance as designed.	Newark Engineering	In progress	X	2020-Newark-007
Newark-5: Hazmat Material Command Vehicles and foam Fire Apparatus – The purchase of a hazardous materials quick response command vehicle and Hazmat/foam fire apparatus to more effectively respond to a hazardous material incident in the City/region.	Newark Fire Department	Completed		
Newark-6: Prevention of leakage, mold, mildew, and collapse of roof in 68 of our public buildings/facilities, particularly 17 of our most critical	Newark Engineering	Completed		
Newark-7: Flood prevention and mitigation in buildings in flood prone areas and on vacant city land in those areas potentially through reduction in Combined Sewer Overflow, implementation of green infrastructure projects and property acquisitions where appropriate.	Newark Engineering	In progress	X	2020-Newark-002
Newark-8: Newark Passaic Riverfront Acquisition	Newark Office of Emergency Management	Completed		



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 #
Newark-9: Installation of back-up generators at critical municipal buildings/facilities to ensure continuity of operations	Newark Office of Emergency Management	Completed		
Newark-10: Installation of back-up generators at critical designated shelter locations to ensure continuity of operations	Newark Office of Emergency Management	Completed		
Newark-11: Newark Back-up Uninterruptible Power Supply (UPS) systems for Critical Traffic Intersections	Newark Office of Emergency Management	Completed		
Newark-12: Newark Wayne Potable Water Pump Station emergency power supply & SCADA	Newark Office of Emergency Management	Completed		
Newark-13: Newark Chittenden Road Pump Station Generator & SCADA	Newark Office of Emergency Management	Completed		
Newark-14: Newark Vailsburg Ditch/Flood Control Mitigation Project	Newark Office of Emergency Management	No progress		
Newark-15: Newark Stormwater Management Through Green Infrastructure Project	Newark Office of Emergency Management	In progress	X	2020-Newark-015
Newark-16: Install Quick Connect Tap Boxes at Critical Facilities/Municipal Building Project	Newark Office of Emergency Management	Completed		
Newark-17: Hazard mitigation planning and project identification for Residential Flood Prevention	Newark Office of Emergency Management	In progress	X	2020-Newark-002
Newark-18: Newark Queen Ditch Drainage Upgrade Project	Newark Office of Emergency Management	Completed		
Newark-19: Newark Adams South and Wheeler Avenue Drainage Improvements Project	Newark Office of Emergency Management	In progress	X	2020-Newark-008
Newark-20: Newark Ironbound Recreation Center Flood Mitigation Project	Newark Office of Emergency Management	Completed		
Newark-21: Newark Community Education and Outreach Project	Newark Office of Emergency Management	Completed		



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 #
Newark-22: Newark Cedar Grove Reservoir Improvements Project	Newark Office of Emergency Management	Completed		
Newark-23: Newark Meadowlands Storm Water Pump Station Project	Newark Office of Emergency Management	In progress Project is 80% complete. Working in conjunction with Port Authority to complete the remaining	X	2020-Newark-009
Newark-24: Encourage compliance with FEMA's Preliminary Work maps	Newark Engineering	In progress	X	2020-Newark-010
Newark-25: Installing flood control measures in flood zone areas of the City, (i.e., levees, trenches, sump pump systems)	Newark Engineering	In progress Working with the US Army Corps of Engineers on implementing the Newark Flanking Plan.	X	2020-Newark-011
Newark-26: Implement renewable energy, smart grid technology and alternative back-up generation assets, would also be appropriate solutions to solve or energy related issues (if they arise)	Newark Office of Emergency Management	No progress The City currently does not have the capacity to implement this project.		
Newark-27: "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 and if possible, convert to open space and/or encourage green infrastructure. 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 from FEMA and local match availability. Specifically identified are properties in the following areas: Newark Passaic Riverfront Acquisition (refer to Newark-11 above)"	Newark Engineering, FPA	In progress	X	2020-Newark-002
Newark-28: 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: •Providing general natural hazard risk, preparedness and mitigation, and related NFIP information to the community through partnerships with community development corporations or community non-profit organizations. •Including natural hazard risk and risk reduction information through social media channels and email blast systems.	Supervisor's Office	Ongoing Active participant in FEMA Coastal Restudy process and engaging with NJ Department of Environmental Protection, Bureau of Climate Resilience Planning.		



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 #
<ul style="list-style-type: none"> •Posting of flyers and other readily available NFIP informational materials at City Hall or distributing at regular community 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 in the annual newsletter. 				
<p>Newark-29: Develop and implement a post-event damage assessment program, including the following elements:</p> <ul style="list-style-type: none"> •Conduct public outreach/education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. •Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. •Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Town/Village (e.g. building permit process). 	Newark Engineering, FPA	In progress	X	2020-Newark-017
<p>Newark-30: Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.</p>	FPA	No progress The City met with NJDEP CRS Coordinator to discuss program and local roles and responsibilities. The City does not currently have the capacity and resources to hire a Newark CRS Coordinator to support this activity.		
<p>Newark-31: Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).</p>	FPA	No progress The City does not currently have the capacity and resources to hire a Newark CRS Coordinator to support this activity.		
<p>Newark-32: Have designated NFIP Floodplain Administrator (FPA), and other local officials who would benefit, become a Certified Floodplain Manager (CFM) through the Association of State Floodplain Managers (ASFPM) and New Jersey Association for Floodplain Management (NJAFM), and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis (BCA) and Substantial Damage Estimation (SDE).</p>	FPA	In progress FPM has been identified, training to be conducted for certification	X	2020-Newark-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 #
Newark-33: Enhance/expand tree maintenance program and coordination with utilities (e.g., PSEG).	Newark Engineering	Complete		
Newark-34: Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	City of Newark	Ongoing		



In addition to the above progress, the City of Newark has identified the following mitigation projects/activities that have also been completed but were not identified in the 2015 HMP mitigation strategy:

- The City of Newark has developed and implemented their own fiber network for internet services. This will help provide another layer of protection from internet loss which prohibits distribution of emergency outreach during hazard events.
- The City of Newark has a potable water reservoir located in the Township of Cedar Grove. The city installed fencing around the reservoir. Trees have been removed from the area to prevent from falling on the fence.
- Newark Jackson Street Bridge has a tide gauge hooked into the Stevens Flood Advisory System. The system provides real time readings of water levels and flood forecasting.
- The city is completing traffic optimization studies focusing on the Raymond Boulevard corridor to optimize safety and flow.
- The city is working on a feasibility study for a stormwater fee. This process should take 2 years and may result in additional funding resources for stormwater mitigation in the city.
- The city has built a flood wall at Riverfront Park.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The City of Newark participated in a risk assessment workshop in September 2019 where detailed information was provided on assets exposed and vulnerable to the identified hazards of concern. The City of Newark participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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). Refer to Section 6 and Appendix H (Mitigation Strategy Supplement) for a more complete description of the Mitigation Toolbox and its resources.

Table 9.15-16 summarizes the comprehensive-range of specific mitigation initiatives the City of Newark would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ Table 9.15-17 provides a summary of the prioritization of all proposed mitigation initiatives for the HMP update and Table 9.15-18 summarizes the actions by type across hazards of concern.



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-Newark-001	420 Sanford Avenue Firehouse	The firehouse is located in an area that requires its service and a relocation is not possible at this time due to lack of available space. Over time the firehouse foundation has settled and sank into the soil, resulting in cracks in the foundation. The firehouse is at risk for continued damage and may be rendered unusable.	The city will perform a feasibility assessment to determine the best course of action to correct the settling issue and fix foundation issues. The city will then implement the most effective identified strategy.	Existing	Flood	1, 2, 6	<u>Engineering Department</u>	Assistance to Firefighters Grants (AFG), municipal budget	Firehouse maintains critical services to community	TBD by feasibility assessment	2-5 years	High	SIP	PP
2020-Newark-002	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages the East Ward and Frelinghuysen Avenue areas. These areas are residential, and these properties have been repetitively	Conduct outreach to 30 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives.	Existing	Flood	2	NFIP <u>Floodplain Administrator</u> , 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.	\$3 million	3 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
		flooded as documented by paid NFIP claims. The city currently has 21 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 in the Brook, Drakes Lane, Lennox Avenue, and Lincoln Place area that experience frequent flooding (high risk areas).											
2020-Newark-003	Hire additional IT support/staff for OEM	OEM needs additional IT support/staff to ensure they are able to get messages out quickly and update	OEM will hire additional support staff to specialize in IT to aid outreach and	N/A	All hazards	3, 5	<u>OEM</u>	Municipal budget	Increased capacity for outreach and emergency messaging.	Salary	6 months	High	EAP, LPR	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
		educational information on their website, social media, etc. in a timely manner.	emergency messaging.											
2020-Newark-004	McClellan St. stormwater pumping station	McClellan St. requires widening and new stormwater system.	City will complete project which includes widening of the roadway under installation of a new drainage system and a pump.	Existing	Flood, Severe Storm	1, 2	Newark Engineering, NJ DOT	NJ DOT, municipal budget	Roadway widened and drainage improved	\$65,000	Within 3 years	High	SIP	SP
2020-Newark-005	Meadowland stormwater pumping station and emergency power supply	The Meadowland stormwater pumping station lacks backup power.	Installation of emergency backup electric generators so the pump station can remain operational during power outages to prevent flooding at Newark Airport and the low lying areas of the East and South Wards during hurricanes	Existing	Utility Interruption, Flood	1, 2, 6	Newark Water and Sewer Utilities	Port Authority and City of Newark cost share	Protection of pump station from utility failure.	\$35,000	1 year	High	SIP	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
			and/or heavy rain events											
2020-Newark-006	Peddie St. outfall improvements	Peddie St. outfall is undersized	Replacement of undersized failing netting facility and the removal of sediment from the Peddie Ditch that cause impediments that restrict the flow of water in the existing pipe.	Existing	Flood, Severe Storm	1, 2	<u>Newark Water and Sewer Utilities</u>	Municipal budget	Increased outfall capacity, reduced flooding.	\$15,000	Within 3 years	High	SIP	SP
2020-Newark-007	Frelinghuysen/Em pire/ Meeker St. stormwater improvements	Queen Ditch needs additional capacity.	This project would remove that blockage and restore capacity of the Queen Ditch so the existing Queen Street Outfall, and the connected upstream sewers, can drain and provide storm water conveyance as designed	Existing	Flood, Severe Storm	1, 2	<u>Newark Water and Sewer Utilities</u>	Municipal budget	Increased capacity, reduced flooding	\$30,000	Within 5 years	High	SIP	SP
2020-Newark-008	Newark Adams, South and Wheeler Avenue Drainage Improvements Project	Increased drainage improvements are necessary	The city will continue to make drainage improvements on the	Existing	Flood, Severe Storm	1, 2	<u>Newark Office of Emergency Management</u>	Municipal budget	Decrease in urban flooding	\$25,000	Within 3 years	High	SIP	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
			identified roadways.											
2020-Newark-009	Newark Meadowlands Storm Water Pump Station Project	Increased capacity for stormwater removal is necessary	Installation of Stormwater Pump Station.	Existing	Flood, Severe Storm	1, 2	<u>Newark Office of Emergency Management, Port Authority</u>	Municipal budget, Port Authority	Increased stormwater capacity	\$20,000	1 year	High	SIP	SP
2020-Newark-010	Encourage compliance with FEMA's Preliminary Work maps	Construction needs to meet Preliminary Work map standards.	City will work to ensure all construction is meeting elevation requirements of Preliminary Work Map standards	New and Existing	Flood	2, 3, 4	<u>Newark Engineering</u>	Municipal budget	Increased building standards	\$200	Within 1 year	High	LPR	PR
2020-Newark-011	Newark Flanking Plan	Additional flood control measures are needed in flood zones of the city.	The city will support the USACE Newark Flanking Plan.	New and Existing	Flood	1, 2	<u>USACE, City Administration</u>	USACE	Reduction in flooding	Staff time	Within 5 years	High	SIP	SP
2020-Newark-012	Train FPA to become CFM	The FPA is not a certified floodplain manager.	The city will support the training of the FPA to become a CFM	N/A	Flood	4, 5	<u>City FPA</u>	Municipal budget	Increased staff capability	Staff time	1 year	High	LPR	PR
2020-Newark-013	Include increased stormwater standards in municipal codes	Stormwater flooding is an issue in the city.	The city will explore updating construction requirements to include more stringent stormwater standards	New	Flood	2, 3, 4	<u>Administration</u>	Municipal budget	Increased stormwater standards, reduced stormwater flooding.	Staff time, \$100	1 year	High	LPR	PR
2020-Newark-014	Determine ability of water system to	It is unknown if filtration stations for	The city will work to determine	Existing	Utility Interruption	4	<u>Public Works</u>	Municipal budget	Vulnerability to HAB and potential	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
	handle harmful algal blooms	potable water have capacity to filter out microcystin from possible harmful algal blooms which have become more common in the region.	ability of system to handle harmful algal blooms and identify any necessary actions that should be taken.						water shortages determined					
2020-Newark-015	Update the Stormwater Ordinance	The Stormwater ordinance needs to be updated to include new information/requirements.	The city will update the ordinance.	New	Flood	2, 3	Administration	Municipal budget	Meet state standards	Staff time	Within 1 year	High	LPR	PR
2020-Newark-016	Update the Flood Damage Prevention Ordinance	The ordinance needs to be updated with additional information to meet requirements.	The city will update the ordinance.	New	Flood	2, 3	Administration	Municipal budget	Meet state standards	Staff time	Within 6 months	High	LPR	PR
2020-Newark-017	Conduct outreach to hazard prone critical facility operators	Numerous critical facilities are not owned by the City and are prone to hazard damages	The City will conduct outreach to operators of critical facilities to educate them on their hazard exposure and possible mitigation actions.	Existing	All hazards	1, 2, 6	OEM	Municipal budget	Facility owners educated on exposure and possible mitigation actions	Staff time	Within 1 year	High	EAP	PI

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. Such 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. These 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. Such 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 9.15-16. 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-Newark-001	420 Sandford Avenue Firehouse	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Newark-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-Newark-003	Hire additional IT support/staff for OEM	1	1	0	1	1	1	1	1	1	1	1	1	1	1	13	High
2020-Newark-004	McClellan St. stormwater pumping station	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Newark-005	Meadowland stormwater pumping station and emergency power supply	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Newark-006	Peddie St. outfall improvements	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2020-Newark-007	Frelinghuysen/Empire/ Meeker St. stormwater improvements	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Newark-008	Newark Adams, South and Wheeler Avenue Drainage Improvements Project	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2020-Newark-009	Newark Meadowlands Storm Water Pump Station Project	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Newark-010	Encourage compliance with FEMA's Preliminary Work maps	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2020-Newark-011	Newark Flanking Plan.	1	1	1	0	1	0	0	1	1	1	0	0	1	1	9	High
2020-Newark-012	McClellan St. stormwater pumping station	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Newark-013	Include increased stormwater standards in municipal codes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Newark-014	Determine ability of water system to handle harmful algal blooms	1	0	0	0	1	1	1	1	1	1	0	1	1	1	10	High
2020-Newark-015	Update the Stormwater Ordinance	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
2020-Newark-016	Update the Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Newark-017	Conduct outreach to hazard prone critical facility operators	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Note (1): Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

Note (2): Low (0-4), Medium (5-8), High (9-14).



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 Erosion and Sea Level Rise			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Coastal Storm			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Drought			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Earthquake			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Extreme Temperature			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Flood	2020-Newark-010, 2020-Newark-012, 2020-Newark-013, 2020-Newark-015, 2020-Newark-016	2020-Newark-001, 2020-Newark-002	2020-Newark-003, 2020-Newark-017		2020-Newark-003	2020-Newark-004, 2020-Newark-005, 2020-Newark-006, 2020-Newark-007, 2020-Newark-008, 2020-Newark-009, 2020-Newark-011		2020-Newark-003, 2020-Newark-012
Geological Hazards			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Severe Weather			2020-Newark-003, 2020-Newark-017		2020-Newark-003	2020-Newark-004, 2020-Newark-006, 2020-Newark-007, 2020-Newark-008, 2020-Newark-009		2020-Newark-003
Winter Storm			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Wildfire			2020-Newark-		2020-Newark-003			2020-Newark-003



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
			003, 2020-Newark-017					
Civil Disorder			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Cyber Attack			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Disease Outbreak			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Economic Collapse			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Hazardous Substances			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Utility Interruption	2020-Newark-014		2020-Newark-003, 2020-Newark-017		2020-Newark-003	2020-Newark-005		2020-Newark-003
Terrorism			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003
Transportation Failure			2020-Newark-003, 2020-Newark-017		2020-Newark-003			2020-Newark-003

Refer to Section 6 (Mitigation Strategy) for an explanation of the mitigation categories.

9.15.9 Staff and Local Stakeholder Involvement in Annex Development

The City of Newark followed the planning process described in Section 2 (Planning Process) in Volume I of this plan update. 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.15-18. Contributors to the Annex

Entity	Title	Method of Participation
Dorian Herrell	OEM Coordinator, Primary POC	Primary POC, provided information on past events, flood history, and emergency management operations and needs, reviewed the draft and provided comments.



Entity	Title	Method of Participation
Juba Dowdell	OEM Deputy Coordinator	Provided information on past events, flood history, and emergency management operations and needs, reviewed the draft and provided comments.
Phil Scott	Director of the Engineering Department	Provided impact data, contributed to the mitigation strategy, provided information on capabilities
Tanya Fraser	Domestic Preparedness Planner, City of Newark Department of Public Safety, Office of Emergency Management Division	Attended meetings, provided impact data, contributed to the mitigation strategy, provided information on capabilities, reviewed the draft and provided comments.

Figure 9.15-1. City of Newark Hazard Area Extent and Location Map

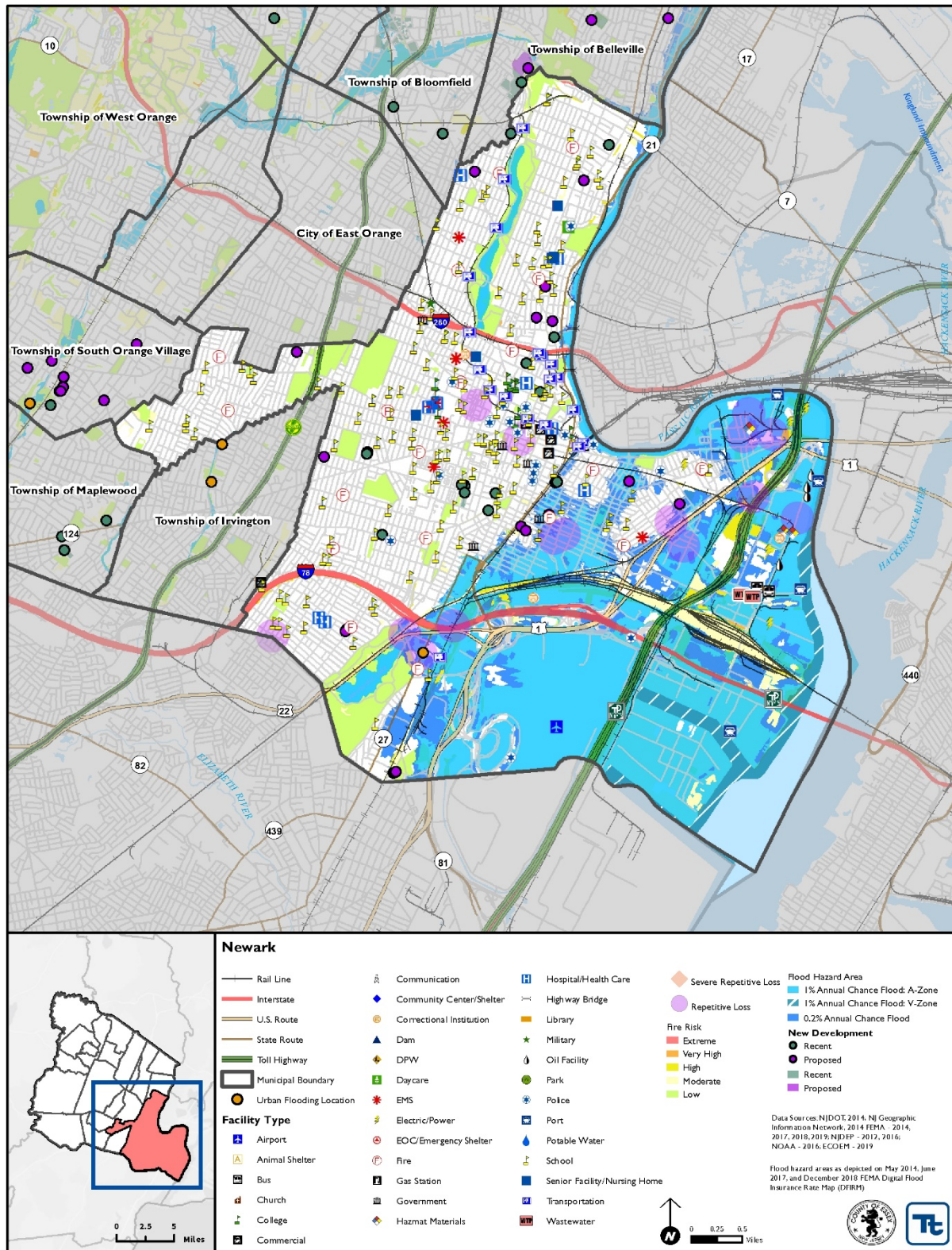
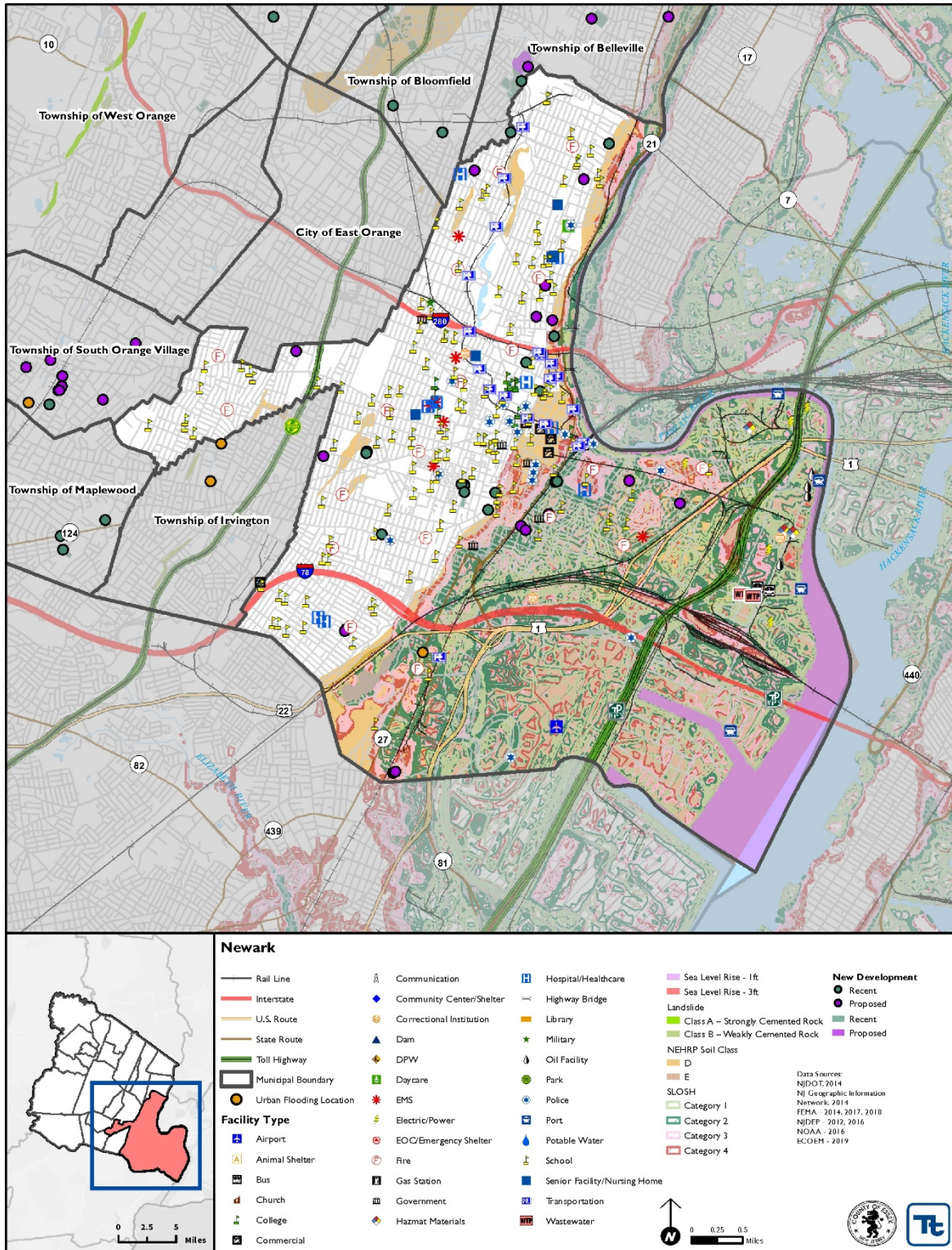


Figure 9.15-2. City of Newark Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	420 Sandford Avenue Firehouse		
Project Number:	2020-Newark-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The firehouse located at 420 Sandford Avenue was built nearly 100 years ago over a brook. The firehouse is located in an area that requires its service and a relocation is not possible at this time due to lack of available space. Over time the firehouse foundation has settled and sank into the soil, resulting in cracks in the foundation. The firehouse is at risk for continued damage and may be rendered unusable.		
Action or Project Intended for Implementation			
Description of the Solution:	The city will perform a feasibility assessment to determine the best course of action to correct the settling issue and fix foundation issues. The city will then implement the most effective identified strategy.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	TBD by feasibility assessment	Estimated Benefits (losses avoided):	Firehouse maintains critical services to community
Useful Life:	TBD by feasibility assessment	Goals Met:	1, 2, 6
Estimated Cost:	TBD by feasibility assessment	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:	2 years to complete feasibility assessment, Full project TBD by feasibility assessment but estimated to be 2-5 years	Potential Funding Sources:	Assistance to Firefighters Grants (AFG), municipal budget
Responsible Organization:	Engineering 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
	Relocate firehouse	N/A	No available land to relocate firehouse in a nearby location
	Rebuild firehouse	\$500,000-\$1M	May not be necessary, 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:	420 Sandford Avenue Firehouse	
Project Number:	2020-Newark-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects critical lifeline services
Property Protection	1	Protection of Firehouse and critical services to protect property
Cost-Effectiveness	1	Feasibility assessment will identify most cost-effective solution
Technical	1	Feasibility study
Political	1	
Legal	1	City owns the property
Fiscal	0	Project requires grant funding
Environmental	1	
Social	1	Benefits highly populated area
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	1	2-5 years
Agency Champion	1	Engineering
Other Community Objectives	1	Protects critical asset
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet	
Project Name:	Mitigate flood-prone properties, including RL/SRL properties



Project Number:	2020-Newark-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the East Ward and Frelinghuysen Avenue areas. These areas are residential, and these properties have been repetitively flooded as documented by paid NFIP claims. The city currently has 21 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 in the East Ward and Frelinghuysen Avenue areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard <i>(in accordance with flood ordinance)</i>	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:	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:	Mitigate flood-prone properties, including RL/SRL properties
Project Number:	2020-Newark-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 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	



BOROUGH OF NORTH CALDWELL

MUNICIPALITY AT A GLANCE

Total Population: **6,637**

Total Land Area: **3.1 sq mi**

Total # Buildings: **2,095**



1% Annual Chance Flood



19

Population Residing
in Floodplain



0

Persons That
May Seek Shelter



\$19 Thousand

Potential
Building Damages



0

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$867 Thousand

Potential Building Damages

NFIP Statistics



32 # NFIP
Policies

3 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

Flood, Severe Weather,
Utility Interruption,
Terrorism

Project Types

Prevention, Property Protection,
Natural Resource Protection,
Emergency Services, Structural Projects



9.16 BOROUGH OF NORTH CALDWELL

This section presents the jurisdictional annex for the Borough of North Caldwell. The annex includes a general overview of the Borough of North Caldwell; an assessment of the Borough of North Caldwell’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 hazards.

9.16.1 Hazard Mitigation Planning Team

The following individuals are the Borough of North Caldwell’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: Kevin O'Sullivan, Borough Administrator Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-228-6412 Email: kosullivan@northcaldwell.org	Name / Title: John D'Ascensio, OEM Coordinator Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-477-0051 Email: jderif@gmail.com
NFIP Floodplain Administrator	
Name / Title: Paul Milani, Construction Code Official Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-228-6410 Email: pmilani@northcaldwell.org	

9.16.2 Jurisdiction Profile

The land of North Caldwell was originally part of a tract of land known as Horseneck in 1701. The Borough of North Caldwell was incorporated in 1898. Well known for its beautiful homes, wooded roads, and healthy climate, the area is known as the “Denver of the East” (Borough of North Caldwell New Jersey, 2014).

North Caldwell operates using the Mayor and Council government set-up (Borough of North Caldwell New Jersey, 2014). According to the U.S. Census Bureau, the Borough has a total land area of 3.016 square miles, of which 3.011 square miles is land and 0.005 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of North Caldwell was 6,183. The estimated 2017 population was 6,637, a 7.3 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 2.4 percent of the population is 5 years of age or younger and 18.8 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.

9.16.3 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. Table 9.16-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.16-1 and Figure 9.16-



2 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.16-2. 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	--	--	--	--	--
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Hilltop by Pulte Homes	Single Family Homes	About 65	Hilltop Drive, Sagamore Drive, Harvest Lane	-	Ongoing
Hillop by RPM	Affordable Housing Townhouses	-	Sagamore Drive	-	Ongoing
Four Seasons North Caldwell	Adult Living Townhouses	-	Hilltop Drive, Four Seasons Drive	-	Near Completion
Hidden Ridge	Townhouses	-	Summit Drive	-	Near Completion
Falcon Point	Single Family Homes	-	Falcon Point Drive	-	Near Completion
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Not Available.	-	--	-	-	-

* Only location-specific hazard zones or vulnerabilities identified.

9.16.4 Capability Assessment

The Borough of North Caldwell 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.



Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.X.4). The Borough of North Caldwell 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 Caldwell.

Table 9.16-3. 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 and State	Yes	Yes/No	Yes/No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Chapter 34 of the municipal code.</i>					
Zoning Code	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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 107 of the municipal code.</i>					
Subdivisions	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment: 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 107 – Section 33-41.</i>					
Stormwater Management	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 53 of the municipal code.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes/No	Yes/No
<i>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.</i>					
Growth Management			Yes	Yes/No	Yes/No
<i>Comment: State mandated at local level. Chapter 107 (Elements within Chapter 107) of the municipal code, Redevelopment Plan.</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	Yes/No	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 #.
<i>Comment: Chapter 107-33 (Environmental Design, Site Plan Review) of the municipal code. Environmental design and site plan for new constructions is required to assure the preservation and enhancement of natural features and environmental conditions, to preclude the creation of traffic flow or traffic safety problems and to maximize efforts to assure each property owner the right to safe and comfortable enjoyment of</i>					
Environmental Protection	No		Yes		
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Ord. No. 14-87, Ord. No. 12-07. Administered by the floodplain administrator.</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	Yes	Local	-	-	-
<i>Comment: Chapter 3, Article XVIII (Administration of Gov't) of the municipal code outlines the duties, powers, and responsibilities of the Emergency Management Coordinator, Deputy Emergency Management Coordinator, and the use of the National Incident Management System (NIMS) during incident management within the Borough of North Caldwell.</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Master Plan Re-Examination Finished 2019, Pending Adoption in August 2019</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>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 Improvement Planning performed with annual budget.</i>					
Disaster Debris Management Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Floodplain or Watershed Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>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). Annually updated and submitted with NJDEP, 04/2019.</i>					



	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 Pollution Prevention Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment:</i>					
Urban Water Management Plan	No		No	No	-
<i>Comment:</i>					
Habitat Conservation Plan	No		No	No	-
<i>Comment:</i>					
Economic Development Plan	No		No	No	-
<i>Comment:</i>					
Shoreline Management Plan	No		No	No	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No		No	No	-
<i>Comment:</i>					
Community Forest Management Plan	No		No	No	-
<i>Comment:</i>					
Transportation Plan	No		No	No	-
<i>Comment:</i>					
Agriculture Plan	No		No	No	-
<i>Comment:</i>					
Climate Action Plan	No		No	No	-
<i>Comment:</i>					
Tourism Plan	No		No	No	-
<i>Comment:</i>					
Business Development Plan	Yes		No	No	-
<i>Comment: Elements of business development are discussed within the Borough of North Caldwell Master Plan</i>					
North Caldwell Redevelopment Plan	Yes	Local	No	No	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>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. Approval and signoff in 2018</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment: A risk assessment was performed in 2001 to identify threats and hazards around the Borough.</i>					



	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 #.
Post-Disaster Recovery Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Continuity of Operations Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Public Health Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Other	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					

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, Construction Code Office
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, near capacity but most likely would have been assessed as part of affordable housing study.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of North Caldwell.

Table 9.16-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board / Zoning Board of Adjustment
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	Nixle, Reverse 911
Maintenance program to reduce risk	Yes	Vegetation Management, Catch-basin cleaning, Hydrant flushing, Detention Basins



Staff/Personnel Resource	Available?	Department/Agency/Position
Mutual aid agreements	Yes	Surrounding Communities, County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer (Consultant), Borough Administrator
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer (Consultant), Borough Administrator, Construction Code Official
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer (Consultant), Borough Administrator, Construction Code Official
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Borough Engineer (consultant)
Staff with education/knowledge/training in low impact development	Yes	Borough Engineer (consultant)
Surveyors	Yes	Borough Engineer (consultant)
Stormwater engineer	Yes	Borough Engineer (consultant)
Personnel skilled or trained in GIS applications	Yes	Some technical knowledge exists, but infrastructure cataloged within GIS.
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Grant writers	Yes	Engineering/Department Heads
Resilience Officer	No	-
Watershed planner	Yes	Borough Engineer (consultant)
Environmental specialist	Yes	Health Officer
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of North Caldwell.

Table 9.16-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes- Generally doesn't meet grant req's
Capital Improvements Project Funding	Yes - Finance
Authority to Levy Taxes for Specific Purposes	Yes - Mayor and Council
User Fees for Water, Sewer, Gas or Electric Service	Yes (Water and Sewer)
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	Yes/No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	-
Other	-



EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Borough of North Caldwell.

Table 9.16-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Police Department
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; Nixle alerts, website, Facebook
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, Nixle alerts, website, Facebook
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes, Lightning Detection System

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of North Caldwell.

Table 9.16-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	NP	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	-	-	-
Public Protection (Fire ISO Protection Class)	Yes	4	2014
Storm Ready Certification	NP	-	-
Firewise Community Classification	NP	-	-
Sustainable Jersey	NP	-	-

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.



Table 9.16-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	Medium
Drought	Medium
Earthquake	Low
Extreme Temperature	High
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Medium
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	Medium
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	High
Disease Outbreak	Low
Economic Collapse	Low
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure	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 9.16-10. 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)	Paul Milani, Construction Code 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?	January 2020
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Yes
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? <ul style="list-style-type: none"> If so, state what they are. 	No



Criterion	Response
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No; Was included in the 2018 Hackensack-Passaic Watershed, 02030103 Flood Risk Report
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? <input type="checkbox"/> If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> 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?* <ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Flood insurance policies: 32 Insurance in force: \$9,526,000 Premium in force: \$17,528
How many total loss claims have been filed in your jurisdiction?* <ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Total loss claims: 23 Claims still open or closed without payment: 8 Total payments for losses: \$121,188
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 03/31/2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

Planning Board: The North Caldwell Planning Board is comprised of 9 voting members including the Mayor and Borough Administrator. The Borough's Engineer and Planning Board Attorney are always in attendance. The Board hears applications in the Borough dealing with the following; Major and Minor Subdivisions, Site Plan Waivers, Preliminary and Final Site Plans. The primary responsibilities of the Planning Board are to:

- Make, adopt and amend the Master Plan of the Borough of North Caldwell
- Administer Subdivisions of land and site plan reviews
- Provide input and recommendations to the Borough Council on land use ordinances.

Engineering Department: The Borough Engineer is responsible for all municipal engineering and design, the preparation of plans and specifications for projects authorized by the Mayor and Council and the preparation of preliminary designs and cost estimates for proposed improvements. The engineer prepares contracts, attends the opening of sealed bids, completes contracts with successful bidders, checks bonds and insurance policies, supervises construction progress and inspections, and certifies estimates for payment.

Building Department: The Building Department has numerous functions including, but not limited to:

- Issuing building permits for construction, demolition, remodeling of and repair of structures upon the approval of applications for same.
- Issuing permits for signs, air-conditioning, oil burners and oil tanks.
- Performing inspections for and issuing certificates of occupancy.



- Investigating complaints of violations of Borough codes and ordinances dealing with building, zoning and property maintenance.

The Building Department enforces the provisions of the Uniform Construction Code, the Borough Property Maintenance Code and such other codes as may be required to be enforced within the Borough. The present BOCA (Basic Building Code) was adopted by ordinance in 1977 along with a National Plumbing Code and the New Jersey Uniform Construction Code with ongoing updates approved on a regular basis by the State of New Jersey. Maintenance Code covers all buildings and property. Enforcement of these codes helps prevent the deterioration of buildings throughout and Borough. Proper occupancy standards of all buildings are maintained to preserve the residential atmosphere of the Borough and the general welfare of the citizens. Permits are required for almost all building and renovating, moreover, all contractors and landscapers must be licensed with the State of New Jersey

Division of Zoning Enforcement: The Zoning Officer is responsible for supervising all building activity and operations within the Borough for the purpose of insuring compliance with Chapter 107 “Zoning and Land Use” of the Code of the Borough of North Caldwell. Applications for variances from the zoning ordinance are heard by the Board of Adjustment. The Board of Adjustment consists of seven members and two alternates, each of whom is appointed by the Mayor and Council for a term of four years. The Board conducts regularly scheduled hearings after public notice.

Public Works: Borough matters relating to streets, water, sewers, parks, buildings and grounds and general maintenance are under the authority of the Department of Public Works.

Placeholder for areas of additional integration regarding committees/departments that tie to mitigation capability

Sustainable Essex Alliance: The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

9.16.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Borough of North Caldwell’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.16-11 provides details



regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.16-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	-

9.16.6 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 9.16-2 summarizes the risk assessment results for the Borough of North Caldwell 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 9.16-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$867,292	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$4,615,008	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	13	NEHRP D&E:	4	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$829,243	
						2,500-year Loss:	\$15,482,457	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,245	Physical 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.		Low
		Population Below Poverty Level:	133					
Flood	100- and 500-Year Mean Return Period Event	100-year	19	100-year	6	100-year Loss:	\$18,789	High
		500-year	51	500-year	16			
Geological		Class A:	0	Class A:	0	Class A:	0	Moderate



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
		Class B:		Class B:		Class B:		
	High Landslide Susceptibility Areas	Class B:	57	Class B:	18	Class B:	\$22,907,921	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	16	Wildfire:	5	Wildfire:	\$5,140,141	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of North Caldwell.

- Number of repetitive loss (RL) properties: 3
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

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 AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplains.

Table 9.16-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Walker’s Pond Dam	Dam	-	X	Mitigation Actions Proposed Below

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

- There is increased runoff and changes to drainage patterns around the Borough.
- Increased demand on aging stormwater infrastructure and the need for additional maintenance is causing increased demand on limited manpower and budget.
- There are 3 repetitive loss properties located in the Borough. These properties have been repeatedly damaged by flooding.
- A recently acquired dam, which requires maintenance and construction to maintain.
- Consider additional flood studies throughout municipality (could be a phased project under FMA)
- There is a lack of cell coverage in certain areas.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of North Caldwell 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 Caldwell has significant exposure; refer to Figures 9.16-1 and 9.16-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Borough of North Caldwell. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Borough of North Caldwell has reviewed the Essex 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:

- Changed the calculated ranking for flood from Low to Medium
- Changed the calculated ranking for geological hazards from Low to Medium
- Changed the calculated ranking for wildfire from Low to Medium
- Changed the calculated ranking for civil disorder from Low to Medium
- Changed the calculated ranking for transportation failure from Low to Medium

Table 9.16-14. Borough of North Caldwell Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Medium	High	High	Medium	Medium	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Failure	Terrorism	Transportation Failure
Low	Medium	Low	High	High	Medium



9.16.7 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. b

Table 9.16-15. 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 #
North Caldwell-1: Connect electric system at Community Center/DPW Building on Gould Avenue to existing generator at Police Station.	Fire Dept	Completed		
North Caldwell-2: "Obtain backup power at critical facilities to ensure continuity of operations. Specifically identified at this time: 1. North Caldwell Borough Hall/EOC generator; 2. North Caldwell Stephanie Drive pump station generator 3. North Caldwell Birch Avenue sewer pump station generator"	Borough Manager	1. Done 2. Temp. Portable Generator Used 3. Temp. Portable Generator Used		
North Caldwell-3: Provide electric backup power to Borough two way radio communication system at Skyline Drive	Borough Manager	Incomplete	X	2020-North Caldwell-002
North Caldwell-4: Culvert repair in the area of Timber Drive, Deer Trail Road and Brookside Terrace. Replace and repair sections of corrugated metal pipe	Borough Engineering	Brookside Terrace is completed, Deer Trail Road and Timber Drive are not yet complete		
North Caldwell-5: Replace Fire Department Pumper Truck	Fire Dept	Completed in 2015		
North Caldwell-6: Upgrade pumping stations and add alarm systems to current Borough wide sanitary system	Borough Engineering	Budgeted for 2020	X	2020-North Caldwell-002
North Caldwell-7: 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, conduct outreach/public education.	Borough Engineering, FPA	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	Enter 2020 HMP Action #
Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability. Specifically identified are properties in the following areas: <ul style="list-style-type: none"> •Grandview Avenue •Green Brook Area 				

The Borough did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of North Caldwell participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of North Caldwell was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.16-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of North Caldwell 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High, Medium, or Low*.

Table 9.16-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.16-18 summarizes the actions by type across hazards of concern.



Table 9.16-16. 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-North Caldwell-001	Mitigate the Green Brook Erosion	There has been significant streambed and streambank erosion occurring along Green Brook in North Caldwell which has impacts on the County's road and utility infrastructure. The affected road leads to the West Essex Regional Middle School and High School and could affect traffic to the schools.	The Borough will work to meet with Fairfield, Essex County and the Green Brook Country Club (and any other stakeholders as identified) to develop a reasonable solution and cost sharing agreement for the streambed and bank stabilization of the Green Brook. The most feasible project will be used for grant applications to agencies such as FEMA and NJOEM.	Existing	Flood	1, 2	Essex County, North Caldwell Administration, Fairfield Administration and Green Brook Country Club	County, municipal budget, HMGP	Erosion mitigated and roadway protected	TBD by selected solution	TBD by selected solution	High	NSP	NR
2020-North Caldwell-002	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	The Borough's water tank on Skyline Drive is in a remote location and lacks backup power in the event of utility interruption. Further, the site does not have adequate and reliable alarms for	North Caldwell will pursue additional funding for a diesel generator to power the water tank site(including public safety communication s, pumps and water tank controls). The Borough will	Existing	Utility Failure	2	Borough Administration, DPW and OEM	HMGP, municipal budget	Water Tower protected from utility failure	\$50,000	1 year	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
		communication to the Borough in a timely manner in the event of a system failure. Additionally, the site also lacks adequate security fencing.	also pursue additional funding for upgrades to a SCADA alarm system for remote monitoring and control.											
2020-North Caldwell-003	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages near Amelia Street, Mountain Avenue and Robin Hill Road. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims.	Conduct outreach to 3 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 on Amelia Street, Mountain Avenue and	Existing	Flood, Severe Storm	1,2,3	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.	\$3 million	3 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
			Robin Hill Road that experience frequent flooding (high risk areas).											
2020-North Caldwell-004	Drainage Study	There is increased runoff and changes to drainage patterns around the Borough.	The Borough has authorized an initial drainage study to be completed within the next few months. The results of the study will be used to determine the best feasible solution and will be implemented.	New and Existing	Flood, Severe Storm	1, 2, 3	<u>Borough Administration</u> , Essex County	Municipal Budget	Reduction in drainage issues around the Borough.	TBD by Selected Solution	Long	High	LPR	PR
2020-North Caldwell-005	Enhanced Stormwater Maintenance Plan	Increased demand on aging stormwater infrastructure is causing increased demand on limited manpower and budget.	Create and implement an enhanced ongoing stormwater maintenance plan to ensure drainage infrastructure and catch basins are in top condition	New and Existing	Flood, Severe Storm	2, 3	<u>North Caldwell DPW</u>	Municipal Budget	Reduction in Stormwater Runoff impacts around the Borough	Medium	Short	High	LPR, SIP	PR, PP
2020-North Caldwell-006	Walker's Pond Maintenance and Inspection	Dam at Walker's Pond, a recently acquired municipal property located at 400 Mountain Avenue, requires ongoing maintenance and inspection.	North Caldwell has applied for NJDEP Permits. Upon completion of dredging of Walker's Pond, further evaluation and inspection of	Existing	Flood	2	<u>Borough Administration</u>	Federal and State Grant Funding, Municipal Budget	Increased volumetric capacity for stormwater capacity	TBD by Engineering evaluations	Long	High	SIP, NSP	PP, 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
			the dam will occur to determine future maintenance activities.											
2020-North Caldwell-007	Walker's Pond Dredging and Maintenance	Walker's Pond, a recently acquired municipal property located at 400 Mountain Avenue, is overgrown and requires dredging and ongoing maintenance to ensure proper flow of stormwater infrastructure.	North Caldwell has hired a consultant to submit permit applications, and a separate consultant for construction plans. North Caldwell is pursuing HDSRF Funding through NJDEP.	Existing	All Hazards	2	<u>Borough Administration</u>	Federal and State Grant Funding, Municipal Budget	Increased volumetric capacity for stormwater capacity	TBD by Engineering evaluations	Long	High	SIP, NSP	PP, NR
2020-North Caldwell-008	Flooding Outreach, Study, and Mitigation	There are locations throughout North Caldwell which experience flooding.	North Caldwell will reach out residents of the Borough and seek input for areas with recurring flooding within the next 6-12 months. This feedback will be used to drive future applications for drainage studies and the implementation of the best identified alternative to reduce flood risk. (12-24	Existing	Flood	1, 2, 3	<u>Borough Administration</u>	Federal and State Grants, Municipal Budget	Drainage studies can help to inform reduction in localized flooding throughout the Borough	TBD by Selected Solution	Long	Medium	LPR, SIP	PR, 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
			months from outreach to grant application)											
2020-North Caldwell-009	Telecommunications Improvements	There is a lack of cell coverage in certain areas of North Caldwell Borough.	Work with Essex County Sheriff's Office and other Public Service entities to work to remedy coverage gaps in telecommunication systems.	New and Existing	Utility Interruption	6	<u>Borough Administration, Borough IT, Essex County Sheriff's Office</u>	Federal and State Grants, County Funding, Municipal Budget	Increased communication ability pre, during, and post hazard events.	TBD by Selected Solution.	Long	Medium	SIP	ES
2020-North Caldwell-010	Severe Winter Storm Outreach	The Borough of North Caldwell is affected by Severe Winter Weather events and does not currently have an outreach program for this hazard.	The Borough of North Caldwell will develop a severe winter weather education and outreach program to increase preparedness.	N/A	Severe Winter Weather	3	<u>Borough Administration</u>	Municipal Budget	Increased public awareness	Low	Short	Medium	EAP	PI
2020-North Caldwell-011	Conduct Infrastructure Risk Assessment	The Borough of North Caldwell has not recently conducted internal risk assessment of facilities and infrastructure throughout.	The Borough will conduct internal risk assessments to determine potential terrorist targets and take appropriate actions to work with necessary stakeholders to enhance preparedness.	New and Existing	Terrorism	1, 2, 6	<u>Borough OEM, Borough Administration</u>	Municipal Budget	Medium	Low	Short	Medium	LPR	PR

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 9.16-17. 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-North Caldwell-001	Mitigate the Green Brook Erosion	1	1	1	1	1	0	0	1	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-North Caldwell-002	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-North Caldwell-003	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-North Caldwell-004	Drainage Study	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-North Caldwell-005	Enhanced Stormwater Maintenance Plan	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-North Caldwell-006	Walker's Pond Maintenance and Inspection	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-North Caldwell-007	Walker's Pond Dredging and Maintenance	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-North Caldwell-008	Flooding Outreach, Study, and Mitigation	1	1	1	1	1	0	0	1	0	0	1	0	0	1	8	Medium
2020-North Caldwell-009	Telecommunications Improvements	1	1	1	1	1	0	0	1	0	0	1	0	1	0	7	Medium
2020-North Caldwell-010	Severe Winter Storm Outreach	1	1	1	1	1	0	0	1	0	0	1	0	1	0	7	Medium
2020-North Caldwell-011	Conduct Infrastructure Risk Assessment	1	1	1	1	1	0	0	1	0	0	1	0	1	0	7	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.16-18. 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 Erosion and Sea Level Rise								
Coastal Storms								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-North Caldwell-004, 2020-North Caldwell-005, 2020-North Caldwell-008	2020-North Caldwell-003		2020-North Caldwell-001, 2020-North Caldwell-006, 2020-North Caldwell-007		2020-North Caldwell-005, 2020-North Caldwell-006, 2020-North Caldwell-007, 2020-North Caldwell-008		
Geological Hazards								
Severe Weather		2020-North Caldwell-003, 2020-North Caldwell-004						
Severe Winter Weather								
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-North Caldwell-002			2020-North Caldwell-002	2020-North Caldwell-002		
Terrorism	2020-North Caldwell-011							
Transportation Failure								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.16.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of North Caldwell 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.16-19. Contributors to the Annex

Entity	Title	Method of Participation
Kevin O'Sullivan	Borough Administrator	Primary POC, provided impact data, contributed to the mitigation strategy
John D'Ascensio	OEM Coordinator	Alternate POC; attended meetings; provided information to update the annex including impacts and updated mitigation actions



Figure 9.16-1. Borough of North Caldwell Hazard Area Extent and Location Map

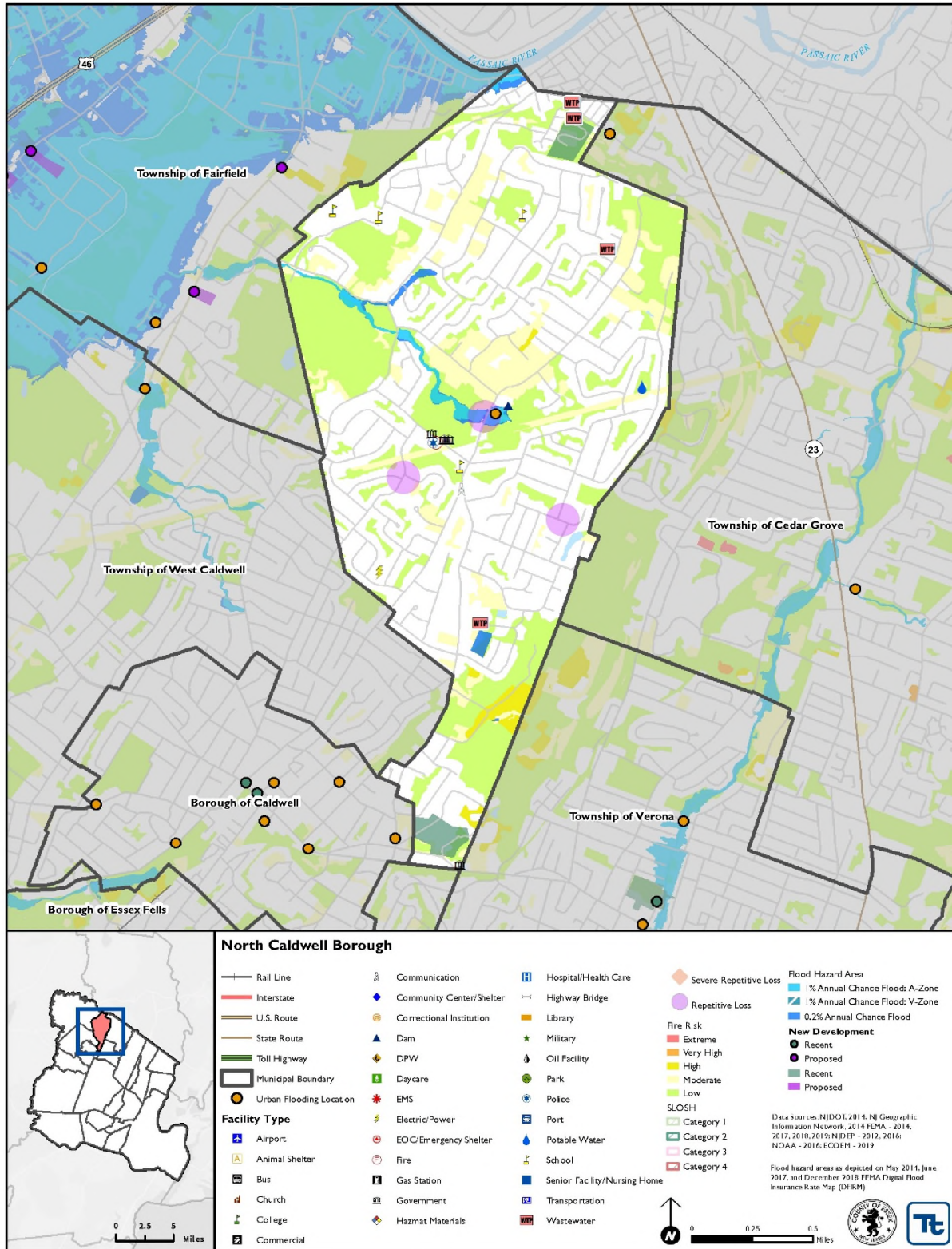
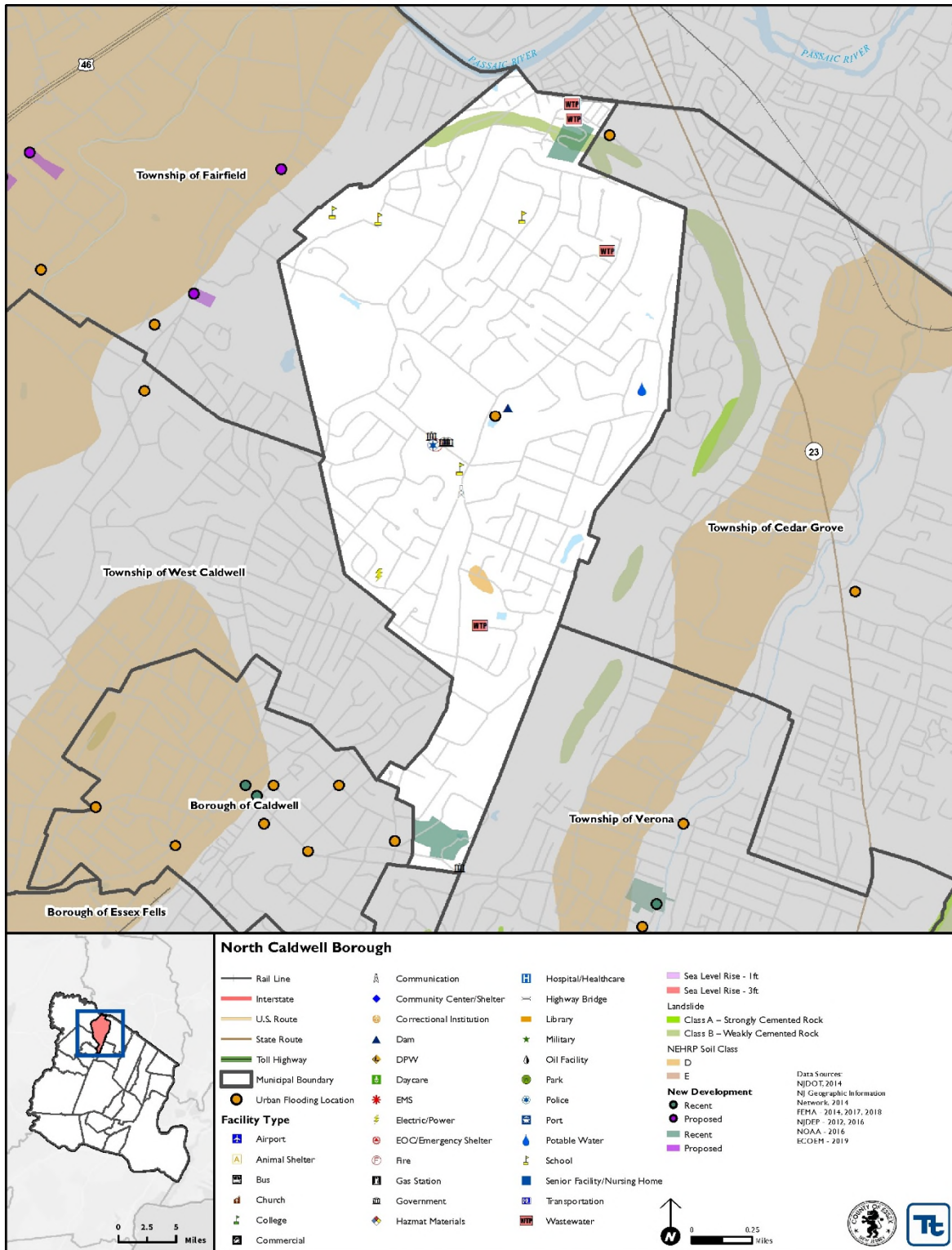




Figure 9.16-2. Borough of North Caldwell Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Mitigate the Green Brook Erosion		
Project Number:	2020-North Caldwell-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	There has been significant streambed and streambank erosion occurring along Green Brook in North Caldwell which has impacts on the County's road and utility infrastructure. The affected road leads to the West Essex Regional Middle School and High School and could affect traffic to the schools.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work to meet with Fairfield, Essex County and the Green Brook Country Club (and any other stakeholders as identified) to develop a reasonable solution and cost sharing agreement for the streambed and bank stabilization of the Green Brook. The most feasible project will be used for grant applications to agencies such as FEMA and NJOEM.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	TBD by selected solution	Estimated Benefits (losses avoided):	Erosion mitigated and roadway protected
Useful Life:	TBD by selected solution	Goals Met:	
Estimated Cost:	TBD by selected solution	Mitigation Action Type:	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	TBD by selected solution
Estimated Time Required for Project Implementation:	TBD by selected solution	Potential Funding Sources:	County, municipal budget, HMGP
Responsible Organization:	Essex County, North Caldwell Administration, Fairfield Administration and Green Brook Country Club	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	Erosion continues to worsen the condition leading to failure of the road, utilities or nearby structures
	Relocate roadway, utilities and all other impacted structures	\$5M+	Does not solve the erosion; acquisition of properties and realignment of roads can be lengthy and costly due to multijurisdictional complications
	Coordinate a group of stakeholders to spearhead and implement a streambed and streambank stabilization project	\$1M+	Stabilization of the streambed and stream banks will slow stream velocities and lessen future erosion; coordination of multiple parties will be time consuming; cooperative effort by all stakeholders allows the issue to be addressed on a large scale
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 the Green Brook Erosion	
Project Number:	2020-North Caldwell-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Nearby schools; county road; critical infrastructure
Property Protection	1	Roads, utilities and structure adjacent to brook
Cost-Effectiveness	1	Cost effective project
Technical	1	Technically feasible project
Political	1	North Caldwell & Essex County are in support of each other
Legal	0	Will require multijurisdictional coordination & NJDEP approval
Fiscal	0	Project will require grant funding and cost sharing
Environmental	1	Long-term solution to erosion has benefit to environment
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Erosion
Timeline	1	Can be achieved in <5 years with stakeholder cooperation
Agency Champion	1	Essex County, North Caldwell, Fairfield & Green Brook CC
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues		
Project Number:	2020-North Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Borough's water tank on Skyline Drive is in a remote location and lacks backup power in the event of utility interruption. Further, the site does not have adequate and reliable alarms for communication to the Borough in a timely manner in the event of a system failure. Additionally, the site also lacks adequate security fencing.		
Action or Project Intended for Implementation			
Description of the Solution:	North Caldwell will pursue additional funding for a diesel generator to power the water tank site (including public safety communications, pumps and water tank controls). The Borough will also pursue additional funding for upgrades to a SCADA alarm system for remote monitoring and control.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Protection from utility interruption	Estimated Benefits (losses avoided):	Water Tower protected from utility failure
Useful Life:	15 years	Goals Met:	
Estimated Cost:	\$50,000	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:	HMGP, municipal budget
Responsible Organization:	Borough Administration, DPW and OEM	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
	Increased DPW inspections during inclement weather or problematic times	\$10,000/yr (overtime)	Does not solve the problem; removes employees from other critical tasks; power loss and utility interruption will still occur but can be met with shorter response time
	Generator, Fencing and SCADA Upgrades	\$350,000	Generator serves as immediate back-up during interrupted power; generator will require ongoing fueling & maintenance; SCADA system would allow remote viewing and control of system for real time management; fencing secures site from vandalism and manmade interruptions
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	
Project Number:	2020-North Caldwell-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reliable water utility to Borough
Property Protection	1	Fencing secures site
Cost-Effectiveness	1	Cost effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	Borough has legal authority
Fiscal	0	Project may require grant funding
Environmental	1	No environmental restrictions on project
Social	1	No social impact
Administrative	1	Administrator & Engineer
Multi-Hazard	1	Power Outage, Utility Interruption
Timeline	1	Can be achieved in <5 years
Agency Champion	1	Borough Administration & DPW
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-North Caldwell-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages near Amelia Street, Mountain Avenue and Robin Hill Road. 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 3 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 on Amelia Street, Mountain Avenue and Robin Hill Road that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard <i>(in accordance with flood ordinance)</i>	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:	
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:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-North Caldwell-003	
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 3 homes in Borough.
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	



TOWNSHIP OF NUTLEY

MUNICIPALITY AT A GLANCE

Total Population: **28,829**
 Total Land Area: **3.4 sq mi**
 Total # Buildings: **7,945**



1% Annual Chance Flood



810

Population Residing
in Floodplain



95

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$3.2 Million

Potential Building Damages



\$19.1 Million

Potential
Building Damages



2

Critical Facilities
in Floodplain

NFIP Statistics



241 # NFIP
Policies

21 # RL NFIP
Properties

1 # SRL NFIP
Properties

Hurricane Storm Surge: Category 2*



35

Population Located
in Category 2 SLOSH



6

Buildings Located
in Category 2 SLOSH

*There is no estimated population or buildings located in Category 1.

Mitigation Action Plan (2020-2025)



Hazards

Coastal Storm, Flood,
Severe Weather, Winter
Weather, Utility
Interruption

Project Types

Prevention, Property Protection, Natural
Resource Protection, Emergency Services,
Structural Projects

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9.17 TOWNSHIP OF NUTLEY

This section presents the jurisdictional annex for the Township of Nutley. The annex includes a general overview of the Township of Nutley; an assessment of the Township’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 hazards.

9.17.1 Hazard Mitigation Planning Team

The following individuals are the Township of Nutley’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
Salvatore Ferraro, Engineering/DPW 1 Kennedy Drive, Nutley, NJ 07110 973-284-4658 sferraro@nutleynj.org	William Cassidy, OEM Coordinator 1 Kennedy Drive, Nutley, NJ 07110 973-590-9802 wcassidy@nutleynj.org
NFIP Floodplain Administrator	
Salvatore Ferraro, Engineering/DPW 1 Kennedy Drive, Nutley, NJ 07110 973-284-4658 sferraro@nutleynj.org	

9.17.2 Jurisdiction Profile



Nutley derived its name from the large estate of the Satterthwaite family, established in 1844, which stretched along the banks of the Passaic River. In 1902, Franklin, New Jersey, once the northeast corner of Newark, changed its name to Nutley when a growth in population prompted a change in the form of government from Township to Mayor/Council. Today, the Township is governed by a mayor and 4-member commission.

The Township of Nutley is located in northern Essex County, along the Passaic River. It is bordered to the north by Passaic County, to the east by Bergen County, to the south by Belleville

Township, and to the west by Bloomfield Township.

According to the U.S. Census, the 2010 population for the Township of Nutley was 28,370. The estimated 2017 population was 28,829, a 1.6 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 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.



9.17.3 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, where available.

Table 9.17-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018	Total
Number of Building Permits for New Construction Issued Since the Previous HMP						
Single Family	3	2	3	5	2	15
Multi-Family	1	0	1	0	1	2
Other (commercial, mixed-use, etc.)	6	1	2	0	3	12
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 and Mitigation if located in Hazard Zone	
Recent Major Development and Infrastructure from 2015 to Present						
551 Centre Street	Mix-Use	23 Units/1 structure	Block 7800 Lot 1.01	Flood Zone A	Structure elevated above design flood elevation	
10 Kingsland Street	Commercial	1 structure	Block 602 Lot 5	Flood Zone X	Structure is not in Flood Zone	
100 Centre Street	Commercial	1 structure	Block 7001 Lot 33	N/A	-	
124 Washington Ave	Commercial	1 structure	Block 6902 Lot 7	N/A	-	
113 East Centre Street, Building 3	Mix-Use	25 Units/1 structure	Block 6904 Lot 13	N/A	-	
113 East Centre Street, Building 4	Mix-Use	25 Units/1 structure	Block 6904 Lot 13	N/A	-	
134 Franklin Avenue	Mix-Use	14 Units/1 structure	Block 7500 Lot 5	Flood Zone AE	Structure elevated above design flood elevation	
599 Franklin Avenue	Mix-Use	7 Units/1 structure	Block 2002 Lot 6	N/A	-	
100 Kingsland Street	Mix-Use	27 Units/1 structure	Block 502 Lot 16.01	N/A	-	
184 Franklin Avenue	Mix-Use	23 Units/1 structure	Block 7501 Lot 5	N/A	-	
4 Franklin Avenue	Mix-Use	2 Units/1 structure	Block 9100 Lot 1	Flood Zone AE	Structure elevated above design flood elevation	
345 Centre Street	Mix-Use	11 Units/1 structure	Block 7502 Lot 7	N/A	-	
74 East Passaic Ave	Mix-Use	4 Units/1 structure	Block 8600 Lot 1	N/A	-	
434-438 Centre Street	Mix-Use	23 Units/1 structure	Block 5902 Lot 28/29	N/A	-	
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years						
Diamond Spring Pool Club - 35 Evergreen Ave	Unknown	Unknown	-	Flood Zone X	-	
Hillside Avenue	Mix-Use	4 structures	Block 2000 Lot 27	Flood Zone A	Project not yet determined	



Type of Development	2014	2015	2016	2017	2018	Total
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 102 L: 2	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2101 L: 1	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2000 L: 4	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2000 L: 5	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 2	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 24	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 102 L: 9	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 201 L: 1	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 3	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 300 L: 1	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 6	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 5	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 200 L: 4	1% Flood: A Zone		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2304 L: 18 Q: C0001	Flood		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2304 L: 18 Q: C0002	Flood		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2304 L: 18 Q: C0003	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0101	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0102	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0103	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0104	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0105	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0106	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0107	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0110	None		Project not yet determined
On3-Prism (formerly known as Roche)	Mix-Use	Unknown	B: 2100 L: 9 Q: C0111	None		Project not yet determined

* Only location-specific hazard zones or vulnerabilities identified.

9.17.4 Capability Assessment

The Township of Nutley 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.

Areas that mitigation is currently integrated are summarized in this subsection. The Township of Nutley 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 Nutley and where hazard mitigation has been integrated.

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 and State	Yes	No	No
<i>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. Township Code Chapter 272 (December 1971); enforced by the Building Department</i>					
Zoning Code	Yes	Local	Yes	No	No
<i>Comment: Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Township Code Chapter 700, adopted by the Board of Commissioners on 10/15/2002 by Ordinance Number 2752; enforced by the Building Department. The Master Plan listed recommended revisions to the zoning code, including the change of the building height definition to allow homes within the 100-year floodplain to be elevated without requiring variances.</i>					
Subdivisions	Yes	Local	Yes	Yes	-
<i>Comment: State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2. Township Code Chapter 630, adopted November 1988; enforced by the Building Department and Planning Board. The Planning Board requires design standards to show that the proposed work will not be susceptible to flood, fire, erosion or other menace.</i>					
Stormwater Management	Yes	Local	Yes	Yes	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Township Code Chapter 622 – adopted July 2007; enforced by DPW. Any building plan that will add impervious coverage to a property must be reviewed by the Municipal Engineer to ensure that preventive measures are put in place to protect persons and property and preserve the public health, safety and welfare. Design and performance standards for stormwater management measures for major development must be developed to meet erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards. A design engineer must show that there is no increase in the peak runoff rates of stormwater and will not increase flood damage at or downstream from the site. Structural stormwater management measures must be designed to take into account existing site conditions, including floodprone areas, slopes, and soil type. The Township provides a lot of outreach on stormwater management in the community.</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes/No	Yes/No
<i>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.</i>					



	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	-	Yes	-	-
<i>Comment: State mandated at local level; Chapter 18 Etsseq, 4/27/1976 of the Township code; enforced by Planning Board and Governing Body</i>					
Shoreline Development	No	-	Yes if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq. Nutley Township is considered a tidally influenced municipality due to their proximity to the Passaic River. New Jersey regulations state that this only pertains to the nearest public roadway which is Route 21, adjacent to the Passaic River. The next closest roadway is River Road which is a county road.</i>					
Site Plan Review	Yes	Local	No	-	-
<i>Comment: Township Code Chapter 600 was adopted by the Board of Commissioners on 10/15/2002 by Ordinance Number 2751; enforced by the Building Department and Board of Adjustment</i>					
Environmental Protection	Yes	Local	Yes	Yes	-
<i>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 200 – Air Pollution – adopted by the Board of Commissioners on 5/6/1969. It declares that pollution of the atmosphere by smoke, cinders, soot, fly ash, gases, fumes, vapors, odors, dust and other contaminants is a menace to the health, welfare and comfort of the residents of the Township of Nutley and a cause of substantial damage to property. Chapter 665 – Trees – adopted by the Board of Commissioners and provides codes for removal of dead and dying trees; shade trees; and preservation of trees. The purpose of the preservation section of this chapter is to preserve, protect, and plant trees that aid in the stabilization of soil by the prevention of erosion and sedimentation; reduce stormwater runoff and the potential damage it can cause; and provide protection against severe weather.</i>					
Flood Damage Prevention	Yes	Local	No	-	-
<i>Comment: Chapter 349 (Flood Damage Prevention) of the Township code. It was adopted by the Board of Commissioners on 5/15/07 by Ordinance Number 3007. The code identifies the Floodplain Administrator to administer and implement the code. A development permit is required before any construction or development begins in any SFHA. The code has requirements for construction and substantial development in the SFHA. For residential properties, new construction and substantial improvements of any residential structure must have the lowest floor (include basement) elevated to or above the base flood elevation. For residential properties in any AO zone, all new construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet (at least two feet if no depth number is specified). And, require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures. Refer to Chapter 349 of the municipal code for details regarding non-residential construction and manufactured homes. Chapter 352 (Flood Hazard Area Certification) was adopted by the Board of Commissions on 5/7/1974 by Ordinance Number 1809. It states that the Engineering Department (within the DPW) will furnish, upon request, a certificate identifying properties as to their location in flood areas.</i>					
Wellhead Protection	Yes	Local	No	Yes	-
<i>Comment: The December 2012 Master Plan includes a discussion on wellhead protection areas. While there are no primary public community water supply (PCWS) wells in the Township, the master plan recognizes a secondary well at Vincent Place and that portions of the Township are located within areas that may impact PCWS in surrounding communities. The master plan included a recommendation that the Township should evaluate greater buffering needs around the Vincent Street well as part of land use planning efforts.</i>					
Emergency Management	Yes	Local	No	Yes	-
<i>Comment: The Nutley Emergency Management Council Resolution was adopted in January 2015 and includes the resolution for the appointment of the Emergency Management Coordinator and adopted the control of hazardous chemicals.</i>					
Climate Change	No	-	-	-	-
<i>Comment: While the Township does not have a specific climate change ordinance, climate change is discussed in the 2012 Master Plan.</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					



	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 #.
Other	Yes	Local	-	-	-
<i>Comment: Water Conservation Ordinance (Chapter 685) adopted on May 16, 2013 in order to protect the Township's water supplies.</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
<i>Comment: Adopted 2012; enforced by the Planning Board and Board of Commissioners. The Land Use Element of the master plan recognizes flooding problems and changes needed to encourage building outside of the 1% annual chance flood area. The Future Land Use Strategy proposes that the Township will continue to expand its open space system of passive and active open space to protect environmentally critical lands, providing species habitat, protect water quality, and control flooding. There are three overlay districts in the Township including a floodplain overlay district. The master plan states that floodplains should be regulated by adding a floodplain overlay district to discourage the type of development in the floodplain that would pose a threat to life and property from flood events. The plan also recommends that the Township work on acquiring properties in the floodways or flood areas and prevent further construction in those areas.</i>					
Capital Improvement Plan	Yes	Local	Allowed	-	-
<i>Comment: Per NJS A 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. This is enforced by the Board of Commissioners for the Township</i>					
Disaster Debris Management Plan	Yes	Local	No	-	-
<i>Comment: This is part of the Township's EOP, dated June 2016; the Parks and Recreation Department and the DPW are the local authority</i>					
Floodplain or Watershed Plan	No	-	No	-	-
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes	-
<i>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 Township adopted a stormwater management element of their master plan in 2008. It provides a strategy for the Township to plan for and manage increased runoff with associated development and changes in land use.</i>					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
<i>Comment: Adopted on March 31, 2005. This plan includes the following: the Township ensures that all new residential development and redevelopment projects are in compliance with Residential Site Improvement Standards; the Township sweeps all streets monthly; the DPW monitors their roads for erosion problems and if identified, repair accordingly.</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	Yes	Local	No	Yes	-
<i>Comment: An element of the Township's 2012 Master Plan; the element states that the Township must protect its natural resources by managing environmentally-sensitive features including floodplains and stormwater runoff.</i>					
Economic Development Plan	Yes	Local	No	-	-
<i>Comment: An element of the Township's 2012 Master Plan</i>					
Shoreline Management Plan	No	-	No	-	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	Yes	Local	No	No	No
<i>Comment: This plan is administered by the Township's Parks and Public Property Department. The initial plan was approved in 2000 and the most recent plan was updated in 2015.</i>					
Transportation Plan	Yes	Local	No	No	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 #.
<i>Comment: An element of the Township's 2012 Master Plan</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	Yes	Local	No	No	No
<i>Comment: Part of the 2012 Master Plan - Green and Sustainability Plan. This element of the master plan acknowledges the impacts of climate change and how it can lead to significant increases in energy costs. The elements lists several actions the Township should take to help with the impacts the changing climate can have on the community.</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	Yes – part of Master Plan	Local	No	No	No
<i>Comment: This is included as an element of the Master Plan. This element evaluates the economy of the Township and identifies trends, strengths, opportunities and constraints. The elements includes an economic development strategy action plan and identifies five areas in the Township that provides development and redevelopment opportunities.</i>					
Other	Yes	Local	No	No	No
<i>Comment: Stream Corridor Management Plan (DPW); Watershed Management Plan (DPW); Open Space Element (part of the Master Plan)</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
<i>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 June 2016; the OEM is the authority for the plan. The purpose of the plan is to protect life and property in emergencies (both goals in the current County HMP) by coordinating response activities of municipal and volunteer entities to ensure their optimum use. The plan is an all-hazards approach to emergency management and covers natural disasters, technological disasters, and national security crisis.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	Yes	Local	No	-	-
<i>Comment: Part of the 2016 EOP</i>					
Continuity of Operations Plan	Yes	Local	No	-	-
<i>Comment: Part of the 2016 EOP</i>					
Public Health Plan	Yes	Local	No	-	-
<i>Comment: Part of the 2016 EOP</i>					
Other	No	-	-	-	-
<i>Comment:</i>					

Table 9.17-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	Code Enforcement typically issues development permits; however, it depends on zoning. Depending on



Criterion	Response
	zoning, the Planning Board, Zoning Board and/or Board of Commissioners will issue permits.
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; but the major area of development is the former Roche site and some areas of smaller development (e.g. gas station redeveloped to mix use); majority of the Township is built out

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Nutley.

Table 9.17-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Township of Nutley Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Shade Tree Advisory Committee Green Team Advisory Committee
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	Economic Development Advisory Board
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Mass emails to residents regarding upcoming storms/events, water main issues, etc. - residents would sign up
Maintenance program to reduce risk	Yes	tree trimming, clearing of sewers, annual catch basin cleaning program, cleaning and repairing of culverts as needed
Mutual aid agreements	Yes	Police, Fire, and EOP for other services; part of UASI through HAZMAT
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	DPW, Engineering (consultants)
Engineers or professionals trained in building or infrastructure construction practices	Yes	DPW, Engineering (consultants)
Planners or engineers with an understanding of natural hazards	Yes	DPW, Engineering (consultants)
Staff with training in benefit/cost analysis	Yes	DPW, Engineering (in-house)
Staff with training in green infrastructure	Yes	DPW, Engineering (consultant)
Staff with education/knowledge/training in low impact development	No	-
Surveyors	Yes	DPW, Engineering (consultants)
Stormwater engineer	Yes	DPW, Engineering (consultants)
Personnel skilled or trained in GIS applications	Yes	IT department with DPW, Engineering (consultants)
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Public Safety
Grant writers	Yes	Revenue and Finance; consultants
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-



Staff/Personnel Resource	Available?	Department/Agency/Position
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Nutley.

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
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes - residents pay for water to water company; sewer is paid through muni taxes; but upgrades are paid through the Sewer Dept. but if someone wants to re-do the sewer line, they need the proper permits to do so; gas and electric is through PSE&G
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes - have ordinance
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	The Township has access to federal grants and have applied to them in the past

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of Nutley.

Table 9.17-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes – Public Safety Department
Do you have personnel skilled or trained in website development?	Yes – IT Department
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – post information online and through emails to residents. The municipal website contains a page called “Emergency Notifications” and encourages residents to sign up on Swift911 to receive reverse 911 notifications.
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> If yes, briefly describe. 	No
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes – recycling calendar, newsletters
Do you have any established warning systems for hazard events? <ul style="list-style-type: none"> If yes, briefly describe. 	Electronic warning signs; mass emails to residents regarding upcoming storms/events, water main issues, etc. - residents would sign up



COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Nutley.

Table 9.17-8. 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; currently working on getting a 3	-
Storm Ready Certification	No		
Firewise Community Classification	No		
Sustainable Jersey	Yes	Bronze	October 21, 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, through engineering and environmental consultants
- Is the administrative supportive of integrating climate change in policies or actions? Yes, the administration is supportive and will review all initiatives that support climate change
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality? Climate change is discussed in the Township’s master plan

Table 9.17-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm (Hurricane, Tropical Storm, Nor'Easter)	Medium
Drought	Medium
Earthquake	Low
Extreme Temperature	High
Flood	Medium
Geological hazards (landslide, subsidence, sinkholes)	Low
Severe Weather	Medium
Severe Winter Weather	High
Wildfire	High
Civil Disorder	High
Cyber Attack	Medium
Disease Outbreak (West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus)	Low



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Economic Collapse (new)	Low
Hazardous Substances	High
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure (vehicular accidents, aviation accidents, railway failures and accidents, roadway and bridge failures)	Low

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?	Engineering/DPW
Who is your floodplain administrator? (name, department/position)	Salvatore Ferraro, DPW
Are any certified floodplain managers on staff in your jurisdiction?	Yes – Salvatore Ferraro
What is the date that your flood damage prevention ordinance was last amended?	May 15, 2007
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?	The most CAC was conducted on January 12, 2011
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 – maps prepared by FEMA adequately address the flood risk in Nutley
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 N/A
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 Township is not interested in joining CRS at the time of the plan update
How many flood insurance policies are in force in your jurisdiction?*	222
• What is the insurance in force?	\$43,847,000
• What is the premium in force?	\$292,628
How many total loss claims have been filed in your jurisdiction?*	240
• How many claims are still open or were closed without payment?	45 CWOP
• What were the total payments for losses?	\$1,734,852
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; CWOP = closed without payment.

ADDITIONAL AREAS OF EXISTING INTEGRATION





- Municipal ordinances and codes pertaining to stormwater and floodplain management are reviewed and updated as needed. By updating design and performance standards for stormwater management measures, it reduces the negative impact of stormwater runoff on water quality and loss of groundwater recharge in receiving waterbodies.
- The Township has completed installing solid manhole inserts in known flood areas in the Township. Installing the inserts prevents additional water from flowing into the system.
- The DPW performs routine maintenance on the storm sewer system. By maintaining the system, it helps reduce debris build up, reduce flood risk, and allow the system to function properly.
- The Township provides stormwater management on their website (<https://www.nutleynj.org/stormwater-management>) and includes public outreach materials to help residents understand stormwater management and reducing stormwater pollution. Providing this information to residents helps the Township with maintaining their stormwater system.
- Working together with PSE&G, the Township Parks Department and DPW maintain and prune trees and remove trees where appropriate. This done on an annual basis and help reduce the amount of debris after a storm and reduce the risk of downed trees and powerlines in the Township.
- **Sustainable Jersey** - 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 is empowering communities to build a better world. Municipalities can receive Sustainable Jersey certification. There are two levels of certification – bronze and silver. The Township is a bronze certified municipality and was certified on October 21, 2019.

9.17.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Nutley’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.17-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. 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)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
July 3, 2014	Flash Flood	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. Washington Ave. was closed due to flooding in Nutley.	Specific damages and losses for Nutley Township were not identified/reported.
January 22-23, 2016	Winter Weather (FEMA-DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast	Specific damages and losses for Nutley Township were not identified/reported.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			<p>New Jersey, and blizzard conditions to the urban corridor and some nearby areas. Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd. Bridges and tunnels from New York City into New Jersey were shut down by mid-afternoon Saturday.</p> <p>At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.</p>	
August 11, 2018	Heavy Rain and Flash Flooding	N/A	A system brought several rounds of heavy rain to Essex County, resulting in widespread flash flooding. Rainfall totals ranged from 2.5 inches to 4 inches.	A business located at 633 Franklin Avenue was damaged, three properties on Elm Street were damaged, basements flooded. Flooding was also reported at Bloomfield and Center, Bloomfield and Harrison, and Bloomfield and Raymond that resulted in people being trapped in their vehicles.

9.17.6 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 9.17-12 summarizes the Township of Nutley risk assessment results and data used to determine the hazard ranking. The following summarizes the hazards of greatest concern and risk to the Township of Nutley.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$3,173,692	High
		Category 2:	35	Category 2:	6			
	Category 1 through Category 4 SLOSH	Category 3:	227	Category 3:	39	500-year Wind Loss:	\$13,964,506	
		Category 4:	558	Category 4:	96			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	1,358	NEHRP D&E:	414	100-year Loss:	\$0	High
		Liquefaction Class 4:	87	Liquefaction Class 4:	15	500-year Loss:	\$3,082,906	
						2,500-year Loss:	\$51,088,073	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,810	Physical 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.		Low
		Population Below Poverty Level:	1,516					
Flood	100- and 500-Year Mean Return Period Event	100-year	810	100-year	231	100-year Loss:	\$19,096,478	High
		500-year	1,044	500-year	295			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	76	Class B:	13	Class B:	\$4,901,120	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter Weather Event	Entire population exposed; The degree of impact to the		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
		population depends on the scale of the incident.		can impact local operating budgets.	
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire: 0	Wildfire: 0	Wildfire: \$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.	Buildings in the immediate vicinity will be most impacted.	Economic assets in the immediate vicinity will be most impacted.	Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.	Damages due to a cyber-attack may be limited.	The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.	Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident	Disease outbreak would not have a direct impact on buildings.	Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.	Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run-down.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines	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



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
	10 NPL Sites in County				
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Nutley.

- Number of repetitive loss (RL) properties: 21*
- Number of severe repetitive loss (SRL) properties: 1*
- Number of RL/SRL properties that have been mitigated: The Township acquired three homes at the end of Donna Court. The land has been converted to open space and deed restricted. This project was part of a FEMA/State of New Jersey grant.

*FEMA, January 7, 2019

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplains. If a new mitigation action is identified, the mitigation action ID is listed; refer to Table 9.17-16 for additional details regarding the project.

Table 9.17-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Nutley Twsp Garage*	Government	X	X	While this structure is in the floodplain, it cannot be elevated due to its purpose and the use of storing equipment. The Township has backup power and fuel for this facility. Prior to storms, the Township moves equipment to higher ground.
Hackensack Meridian School of Medicine at Seton Hall University*	School	X	X	Do not have jurisdiction to mitigate; according to the Township, this building is not in the floodplain

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Certain streams and small waterbodies in the Township do not have their flood hazard areas delineated. This includes: Passaic Avenue/Rutgers Place, Kingsland Street/Bloomfield Avenue, Bloomfield Avenue/Mountainview Avenue, and Franklin Avenue/Harrison Street

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Nutley 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 Nutley has significant exposure; Figures 9.17-1 and 9.17-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 Nutley. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Nutley has reviewed the Essex 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:

- Adjusted the calculated risk ranking for: Flood (low to medium) due to the Township’s history of flood events and damages.

Table 9.17-14. Township of Nutley Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Medium	Medium	Low	Medium	Medium

Geological Hazards	Severe Weather	Winter Weather	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Low	Low

9.17.7 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 9.17-15. 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 #
Nutley-1	Install generators at all essential government facilities to ensure that necessary services and facility operations are operational during emergency events. The following locations have been identified at this time: 1. Energy allocation- generator, 4 sites; 2. Nutley Park Avenue shelter generator 3. Nutley Fire House generator 4. Nutley Rescue Squad generator	Township OEM	Ongoing – have applied for grant funding but did not receive the funds; Township has purchased generators on their own	X	2020-NUTLEY-001
Nutley-2	Nutley Township EOC/Fresh Water well pump generator	Township OEM	Generator has been purchased and installed		
Nutley-3	Nutley minor flood control project. Install gabion walls along Third River near Passaic Avenue bridge with Rutgers Place	Township	In Progress – applied for mitigation grants but denied funding	X	2020-NUTLEY-002
Nutley-4	Cleaning and repairing of culverts within the Township carrying stormwater from various locations to discharge points	Township Engineering, County Engineering	Ongoing – part of the day-to-day duties of the DPW		
Nutley-5	Perform infiltration and inflow study of sanitary system to identify dedicated and non-dedicated material entering system	Township DPW	No Progress	X	2020-NUTLEY-003
Nutley-6	Install gabion walls at specific flood-prone locations along Third River in the Township	Township	In Progress – applied for mitigation grants but denied funding; Town has done gabion walls in certain areas in the park; but there are areas that still need the walls installed	X	2020-NUTLEY-004
Nutley-7	Implement flood proofing measures to the Township’s sanitary sewer pump station	Township DPW	In Progress but need additional funding – pumps have been upgraded and maintained; electrical equipment is elevated (what can be elevated)	X	2020-NUTLEY-005
Nutley-8	Dredging of Third River within the Township	NJDEP, Township, Essex County	No Progress	X	2020-NUTLEY-006
Nutley-9	Review Township ordinances pertaining to stormwater and floodplain management	Township DPW, Township Code Enforcement	Ongoing Capability – updated as needed		



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 #
Nutley-10	Perform study of Passaic River flooding onto River Road in Nutley Township	USACE, NJDEP, Essex County, Township	No Progress	X	2020-NUTLEY-007
Nutley-11	Improve drainage on Bloomfield Ave.	Township DPW	Areas of urban flooding – not a flood zones but prone to flooding due to volume of water that comes during certain storms; piping system cannot handle the amount of water but as soon as it dries up, it clears up	X	2020-NUTLEY-008
Nutley-12	Installation of solid manhole covers and inserts to prevent water infiltration into sanitary system	Township DPW	Ongoing Capability – completed the known flood areas but additional work is needed; adding manhole inserts that doesn't allow water to flow in		
Nutley-13	Maintenance of storm sewer system	Township DPW	Ongoing capability – day to day operation for the DPW		
Nutley-14	Assess and prioritize flood hazard mitigation alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation depending on feasibility. The parameters for feasibility for this initiative would be: funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available. Specifically identified are properties in the following areas: • Passaic Avenue and Rutgers Place	Township Engineering, FPA, NJOEM, FEMA	In Progress – Township has applied for grants to do some work with the river to alleviate/reduce the issues in this area; no funding has been received to date	X	2020-NUTLEY-010
Nutley-15	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: • Providing general natural hazard risk, preparedness and mitigation, and related NFIP information in regular newsletter and mailings	Township	Ongoing Capability – post on website, do a lot of stormwater outreach/notification through mailings, etc.		
Nutley-16	Support participation in the NFIP CRS program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated.	FPA, Township Officials	In Progress – not in CRS but have looked at and would like to participate in	X	2020-NUTLEY-011



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 #
Nutley-17	Enhance/expand tree maintenance program and coordination with utilities (e.g., PSEG).	Township Parks Department, Contractors and Utilities as needed	Ongoing Capability – have worked with PSEG, Parks and DPW; maintain/prune trees, remove trees, etc.; performed annually		

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Nutley participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Nutley participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (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 Township of Nutley 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.17-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.17-18 summarizes the actions by type across hazards of concern.



Table 9.17-16. 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-NUTLEY-001 (previous action)	Generator at the Parks Annex	Problem: The Parks Annex is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage.	Existing	Utility Interruption	1, 2, 6	DPW, Township Board	FEMA HMGP	Continuity of operations	\$50,000	2 years	High	SIP	ES, PP
		Solution: Purchase and install a diesel generator at the Parks Annex. This will allow the building to function during power outages and provide essential services to the community.											
2020-NUTLEY-002 (previous action)	Nutley minor flood control project	Problem: Near the Passaic Avenue bridge, at the intersection with Rutgers Place, flooding occurs during periods of heavy rain. This causes flood damage to surrounding buildings and leads to road closures.	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 6	DPW, Engineer, Township Board	Municipal Budget	Increase protection from flood events; protect roads and buildings from flood damage	\$100,000	2 years	Medium	SIP, NSP	PP, NR, SP
		Solution: Install gabion walls along Third River near Passaic Avenue bridge with Rutgers Place											
2020-NUTLEY-003 (previous action)	Infiltration and inflow study and reduction plan in floodplain areas	Problem: Sections of the Township’s sanitary system are located in the floodplain. During flood events, water is entering the system which leads to the system becoming overwhelmed and result in surcharge. This could lead to sewer backups, sewage entering the waterways, and create a health hazard to residents.	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 6	DPW	FEMA PDM and HMGP, Municipal Budget	Reduce or eliminate the risk of sewage surcharge; protect the health and safety of residents	\$100,000	Within 5 years	High	SIP	PP
		Solution: Conduct an I&I study and reduction plan for sections throughout the Township. The study will identify the amount of infiltration and inflow that enters the system. The study will also determine available solutions. The Township will identify the best solutions, seek funding for solutions, and implement projects.											
2020-NUTLEY-004	Install gabion walls at specific flood-prone locations	Problem: The Township has installed gabion walls in certain areas of the Township; however, there are areas that still need the walls installed.	Existing	Flood, Severe Weather,	1, 2, 6	DPW, Engineer, Township Board	Municipal Budget	Increase protection from flood events; protect roads	\$100,000	2 years	Medium	SIP, NSP	PP, NR, SP



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
(previous action)	throughout the Township	Solution: Conduct a survey of the existing gabion walls in the Township to determine which ones need to be replaced. Also identify locations where walls need to be installed. Once survey is complete, walls will be installed or replaced where necessary.		Coastal Storm				and buildings from flood damage					
2020-NUTLEY-005 (previous action)	Bloomfield Avenue pump station	Problem: The pump station on Bloomfield Avenue pumps a majority of the sewage from one part of the Township. If the station shuts down due to an outage, it creates a major problem, impacting homes in the Township and surrounding municipalities. The Township has upgraded and maintained the pumps and the electrical equipment has been elevated. Solution: Purchase a trailer-mounted portable pump to be used to bypass the stationary pumps in the event the pumps cannot operate properly. This will provide continuity of operations and allow the Township's sewer system to operate during a power outage or flood event.	Existing	Flood, Severe Weather, Severe Winter Weather, Utility Interruption	1, 2, 6	DPW	FEMA PDM and HMGP, Municipal Budget	Reduce sewage backups and surcharge of sewage reducing public health impacts	\$25,000 - \$50,000	Within 5 years	High	SIP	ES
2020-NUTLEY-006 (previous action)	Third River Maintenance Plan	Problem: The Third River flows through the Township. During periods of heavy rain, the river overflows its banks, leading to flooding of surrounding properties. Solution: Develop a maintenance program to reduce the buildup of debris and sediment to increase flow and reduce flooding.	Existing	Flood, Coastal Storm, Severe Weather	1, 2	DPW, Engineer	Municipal Budget	Reduces buildup of debris; reduces flood damage	\$100,000	5 years	High	LPR, NSP	PP, PR, NR
2020-NUTLEY-007 (previous action)	Perform study of Passaic River flooding onto River Road in Nutley Township	Problem: During high tide the Passaic River surcharges the local storm collection system causing local flooding conditions Solution: Study the enhanced hydraulic characteristics of outflow pipes for feasibility of installing back flow/tide gates at outfall points to the Passaic River.	Existing	Flood, Coastal Storm, Severe Weather	1, 2	DPW	FEMA, NJDEP, Municipal Budget	Prevent flood waters from inundation River Road	\$50,000	5 years	Medium	LPR	PR
2020-NUTLEY-008 (previous action)	Study of urban flooding along Bloomfield Avenue and	Problem: There are several areas within the Township that experience flooding during heavy rain events (4"+ inches in short amount of time). The existing stormwater system is older. These areas	Existing	Flood, Severe Weather, Severe Winter	1, 2, 6	DPW, Township Board	FEMA FMA and HMGP	Increase understanding of flood problems in Township;	\$50,000 - \$75,000	Within 5 years	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
	project implementation	are not adjacent to a body of water – identified as urban flooding. The areas include Bloomfield Avenue / Harrison Street intersection, Parallel Street, Stanley Avenue, Rhoda Avenue, Maple Avenue, Milton Avenue/Bloomfield Avenue intersection, Raymond Avenue/Bloomfield Avenue intersection, and Centre Street/Bloomfield Avenue intersection. Solution: Conduct study to identify the cause of the urban flooding. Once study is complete, the Township will evaluate the recommendations from the study and implement projects that will benefit the Township. Additionally, the Township will update the stormwater ordinances to require on-site retention basins.		Weather, Utility Interruption				identify projects to alleviate this problem					
2020-NUTLEY-010 (previous action)	Mitigate flood-prone properties, including RL/SRL properties	Problem: Frequent flooding events have resulted in damages in the various areas in the Township. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. Solution: Conduct outreach to 192 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 identified areas that experience frequent flooding (high risk areas).	Existing	Flood, Severe Weather, Coastal Storm	1, 2, 3	Floodplain Administrator	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.	<\$10,000 for outreach; \$1 million+ for mitigation	3 years	High	SIP	PP
2020-NUTLEY-011 (previous action)	Community Rating System (CRS) Consideration	Problem: The Township has 21 repetitive loss and 1 severe repetitive loss properties. Additionally, there are 241 NFIP flood policies in the Township. The Township currently does not participate in the CRS program.	New and Existing	Flood	1, 2, 3	Floodplain Administrator	Municipal Budget	Residents will receive discounted flood insurance	\$20,000	Within 2 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
		Solution: The Township will determine whether or not they have the means to join CRS. If they do, they will prepare the appropriate documentation to join. If they become a CRS, the residents with flood insurance might receive a discount based on the CRS classification of the Township.											
2020-NUTLEY-012 (previous action)	Generator at Parks and Recreation Building (Recreation Center)	Problem: The Parks and Recreation Building is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage. Solution: Purchase and install a diesel generator at the Parks and Recreation Building. This will allow the building to function during power outages and provide essential services to the community.	Existing	Utility Interruption	1, 2, 6	DPW, Township Board	FEMA HMGP	Continuity of operations	\$50,000	2 years	High	SIP	ES
2020-NUTLEY-013 (previous action)	Generator at Town Hall	Problem: The Town Hall is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage. Solution: Purchase and install a diesel generator at the Town Hall. This will allow the building to function during power outages and provide essential services to the community.	Existing	Utility Interruption	1, 2, 6	DPW, Township Board	FEMA HMGP	Continuity of operations	\$50,000	2 years	High	SIP	ES
2020-NUTLEY-014 (previous action)	Upgrade existing generator at the rescue squad building	Problem: The existing generator at the rescue squad building is older and in need of updating. Solution: Purchase and install a diesel generator at the rescue squad building. This will allow the building to function during power outages and provide essential services to the community.	Existing	Utility Interruption	1, 2, 6	DPW, Township Board	FEMA HMGP	Continuity of operations	\$50,000	2 years	High	SIP	ES
2020-NUTLEY-015 (previous action)	Purchase portable generator to use to run the fresh water well pump during power outages	Problem: The Township has a fresh water well available to residents. It provides clean drinking water for residents to fill up containers. In the event of a power outage, the pump is not available to use. Solution: Purchase a portable generator to use during power outages to allow the	Existing	Utility Interruption	1, 2, 3	DPW	FEMA HMGP, Municipal Budget	Drinking water during power outages	\$10,000	1 year	Medium	SIP	PR, 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
		fresh water well pump to operate and provide clean drinking water to residents.											
2020-NUTLEY-016	Stormwater Discharge Points Study	<p>Problem: There are several areas within the Township that experience flooding during heavy rain events (4"+ inches in short amount of time). The existing stormwater system is older. These areas are not adjacent to a body of water – identified as urban flooding.</p> <p>Solution: Conduct a study to look at all the stormwater discharge points (Bloomfield and Kingsland; Franklin Avenue; Hillside Avenue; and Elm Street) to see how the Township can redesign to create a positive discharge using natural conveyance of an existing waterway in the Township.</p>	Existing	Flood, Severe Weather, Severe Winter Weather, Utility Interruption	1, 2, 6	DPW, Township Board	FEMA FMA and HMGP	Increase understanding of flood problems in Township; identify projects to alleviate this problem	\$75,000 - \$100,000	Within 5 years	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
- 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 9.17-17. 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-NUTLEY-001 (previous action)	Generator at the Parks Annex	1	1	1	1	1	1	0	0	1	1	0	1	1	0	10	High
2020-NUTLEY-002 (previous action)	Nutley minor flood control project	1	1	1	1	0	0	0	1	0	1	1	0	0	0	7	Medium
2020-NUTLEY-003 (previous action)	Infiltration and inflow study and reduction plan in floodplain areas	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-NUTLEY-004 (previous action)	Install gabion walls at specific flood-prone locations throughout the Township	1	1	1	1	1	0	0	0	0	1	0	1	1	0	8	Medium
2020-NUTLEY-005 (previous action)	Bloomfield Avenue pump station	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-NUTLEY-006 (previous action)	Third River Maintenance Plan	1	1	1	1	0	0	0	1	1	1	1	0	0	0	8	Medium
2020-NUTLEY-007 (previous action)	Perform study of Passaic River flooding onto River Road in Nutley Township	1	1	1	1	0	0	0	1	1	1	1	0	0	0	8	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-NUTLEY-008 (previous action)	Study of urban flooding along Bloomfield Avenue and project implementation	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-NUTLEY-010 (previous action)	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-NUTLEY-011 (previous action)	Community Rating System (CRS) Consideration	1	1	1	1	0	0	1	0	1	1	0	1	0	0	8	Medium
2020-NUTLEY-012 (previous action)	Generator at Parks and Recreation Building (Recreation Center)	1	1	1	1	1	1	0	0	1	1	0	1	1	0	10	High
2020-NUTLEY-013 (previous action)	Generator at Town Hall	1	1	1	1	1	1	0	0	1	1	0	1	1	0	10	High
2020-NUTLEY-014 (previous action)	Upgrade existing generator at the rescue squad building	1	1	1	1	1	1	0	0	1	1	0	1	1	0	10	High
2020-NUTLEY-015 (previous action)	Purchase portable generator to use to run the fresh water well pump during power outages	1	1	1	1	0	0	0	0	1	1	0	1	1	0	8	Medium
2020-NUTLEY-016	Stormwater Discharge Points Study	1	1	1	1	1	1	0	0	1	1	1	1	1	0	11	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



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 Erosion and Sea Level Rise								
Coastal Storm	-006	-002, -003, -004, -006, -008, -010, -017		-002, -004, -006		-002, -003, -004, -008, -010, -017		
Drought								
Earthquake								
Extreme Temperature								
Flood	-006, -011	-002, -003, -004, -006, -017		-002, -004, -006		-002, -003, -004, -017		
Geological hazards								
Severe Weather		-002, -003, -017		-002		-002, -003, -017		
Severe Winter Weather		-002, -004, -017		-002, -004		-002, -004, -017		
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption	-015	-001, -017			-001, -012, -013, -014, -015, -016	-001, -012, -013, -014, -015, -016, -017		
Terrorism								
Transportation Failure								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.17.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Nutley 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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
Salvatore Ferraro	Engineering / Recycling Coordinator	Primary POC and floodplain administrator, reviewed annex, attended meetings, provided information, and contributed to the mitigation strategy
William Cassidy	OEM Coordinator	Alternate POC, reviewed annex, attended meetings, provided information, and contributed to the mitigation strategy



Figure 9.17-1. Township of Nutley Hazard Area Extent and Location Map

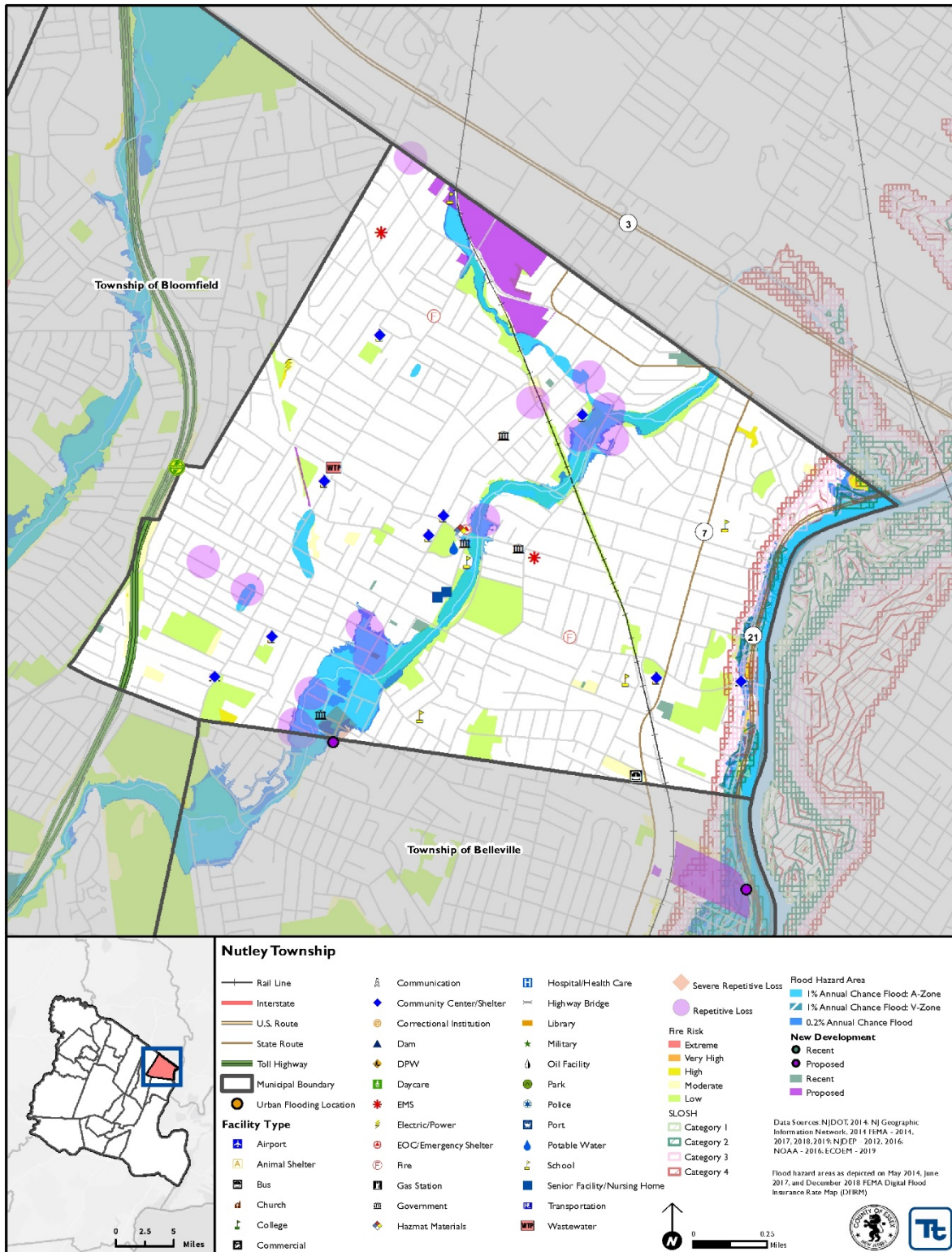
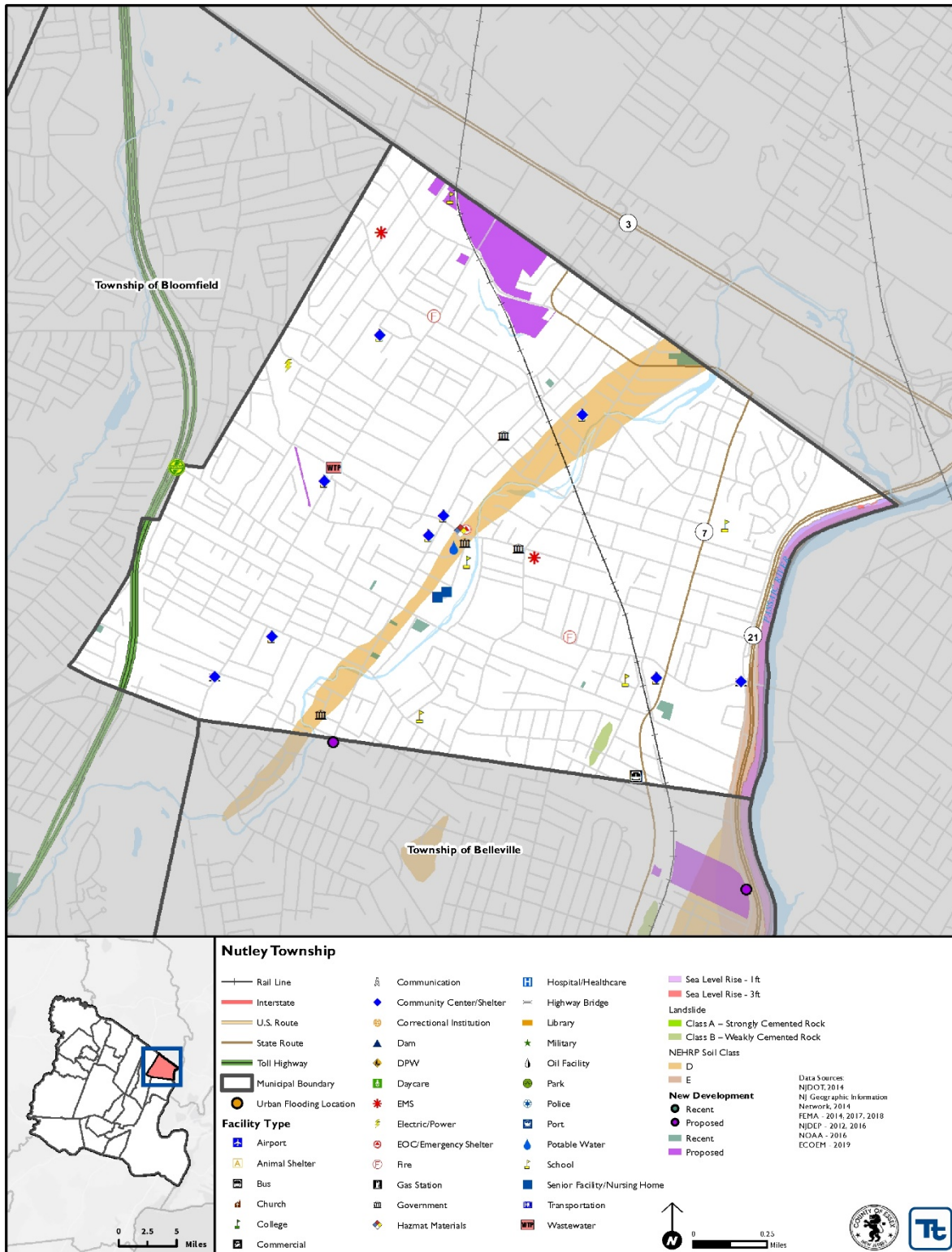




Figure 9.17-2. Township of Nutley Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Generator at the Parks Annex		
Project Number:	2020-NUTLEY-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Parks Annex is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install a diesel generator at the Parks Annex. This will allow the building to function during power outages and provide essential services to the community.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Continuity of operations
Useful Life:	30 years	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	DPW, Township Board	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	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
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 Parks Annex	
Project Number:	2020-NUTLEY-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	I&I Study and Reduction Plan in Floodplain Areas		
Project Number:	2020-NUTLEY-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Sections of the Township's sanitary system are located in the floodplain. During flood events, water is entering the system which leads to the system becoming overwhelmed and result in surcharge. This could lead to sewer backups, sewage entering the waterways, and create a health hazard to residents.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct an I&I study and reduction plan for sections throughout the Township. The study will identify the amount of infiltration and inflow that enters the system. The study will also determine available solutions. The Township will identify the best solutions, seek funding for solutions, and implement projects.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Reduce or eliminate the risk of sewage surcharge; protect the health and safety of residents
Useful Life:	50 years	Goals Met:	1, 2, 6
Estimated Cost:	\$100,000 for the study	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year
Estimated Time Required for Project Implementation:	Within 5 years	Potential Funding Sources:	FEMA PDM and HMGP, Municipal Budget
Responsible Organization:	DPW	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
	Ongoing maintenance and troubleshooting	Based on existing manpower	Not a permanent solution
	Educating residents on what to do in the event of sewer system overflows	\$25,000	increases awareness of residents but problem still exists
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Purchase portable pump	
Project Number:	2020-NUTLEY-003	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce or eliminate health hazards associated with sewer backup
Property Protection	1	Reduce or eliminate damages associated with sewer backup
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	Township owns and operates the sewer system
Fiscal	0	Need to seek grant funding to complete project
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Severe Winter Weather, Utility Interruption
Timeline	1	When funding is received, project can be completed in the next five years
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Bloomfield Avenue pump station		
Project Number:	2020-NUTLEY-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The pump station on Bloomfield Avenue pumps a majority of the sewage from one part of the Township. If the station shuts down due to an outage, it creates a major problem, impacting homes in the Township and surrounding municipalities. The Township has upgraded and maintained the pumps and the electrical equipment has been elevated.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase a trailer-mounted portable pump to be used to bypass the stationary pumps in the event the pumps cannot operate properly. This will provide continuity of operations and allow the Township's sewer system to operate during a power outage or flood event.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Continuity of operations; allow sewer system to operate during outage
Useful Life:	5 years	Goals Met:	1, 2, 6
Estimated Cost:	\$25,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 6 months of receiving funds
Estimated Time Required for Project Implementation:	4 months	Potential Funding Sources:	FEMA FMA and HMGP, Municipal Budget
Responsible Organization:	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
	Purchase additional stationary pumps	\$50,000 - \$75,000	Costly
	Renting portable pumps as needed	\$5,000/month plus damages associated with loss of pump system	Not a quick fix; would need to find vendor and bring pump to Township
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Bloomfield Avenue pump station	
Project Number:	2020-NUTLEY-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce or eliminate health hazards associated with sewer backup
Property Protection	1	Reduce or eliminate damages associated with sewer backup
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	Township owns and operates the sewer system
Fiscal	0	Need to seek grant funding to complete project
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Severe Winter Weather, Utility Interruption
Timeline	1	When funding is received, project can be completed in the next five years
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Study of urban flooding along Bloomfield Avenue and project implementation		
Project Number:	2020-NUTLEY-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Severe Winter Weather, Utility Interruption		
Description of the Problem:	There are several areas within the Township that experience flooding during heavy rain events (4"+ inches in short amount of time). The existing stormwater system is older. These areas are not adjacent to a body of water – identified as urban flooding. The areas include Bloomfield Avenue, Milton Avenue, Raymond Avenue, and Centre Street.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct study to identify the cause of the urban flooding. Once study is complete, the Township will evaluate the recommendations from the study and implement projects that will benefit the Township. Additionally, the Township will update the stormwater ordinances to require on-site retention basins.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event	Estimated Benefits (losses avoided):	Increase understanding of flood problems in Township; identify projects to alleviate this problem
Useful Life:	30 years	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000 - \$75,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 1 year of receiving funds
Estimated Time Required for Project Implementation:	Within 5 years	Potential Funding Sources:	FEMA FMA and HMGP
Responsible Organization:	DPW, Township Board	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 properties that flood in this area	\$50 million	Too costly; acquiring properties reduces tax base
	Upgrade entire stormwater system	\$10 million+	Too 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:	Study of urban flooding along Bloomfield Avenue and project implementation	
Project Number:	2020-NUTLEY-008	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduce or eliminate health hazards associated with sewer backup
Property Protection	1	Reduce or eliminate damages associated with sewer backup
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	Township owns and operates the sewer system
Fiscal	0	Need to seek grant funding to complete project
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Severe Winter Weather, Utility Interruption
Timeline	1	When funding is received, project can be completed in the next five years
Agency Champion	1	
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-NUTLEY-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Coastal Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the various areas in the Township. 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 192 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 identified areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard <i>(in accordance with flood ordinance)</i>	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, 3
Estimated Cost:	\$3 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-NUTLEY-010	
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	
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
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:	Generator at Parks and Recreation Building (Recreation Center)		
Project Number:	2020-NUTLEY-012		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Parks and Recreation Building is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install a diesel generator at the Parks and Recreation Building. This will allow the building to function during power outages and provide essential services to the community.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Continuity of operations
Useful Life:	30 years	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	DPW, Township Board	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	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
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 Parks and Recreation Building (Recreation Center)	
Project Number:	2020-NUTLEY-012	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Generator at Town Hall		
Project Number:	2020-NUTLEY-013		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Town Hall is identified as a critical facility for the Township; however, it does not have a source of backup power in the event of a power outage.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install a diesel generator at the Town Hall. This will allow the building to function during power outages and provide essential services to the community.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Continuity of operations
Useful Life:	30 years	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	DPW, Township Board	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	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
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 Town Hall	
Project Number:	2020-NUTLEY-013	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Upgrade existing generator at the rescue squad building		
Project Number:	2020-NUTLEY-014		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The existing generator at the rescue squad building is older and in need of updating.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase and install a diesel generator at the rescue squad building. This will allow the building to function during power outages and provide essential services to the community.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Continuity of operations
Useful Life:	30 years	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	FEMA HMGP
Responsible Organization:	DPW, Township Board	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	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
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 existing generator at the rescue squad building	
Project Number:	2020-NUTLEY-014	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	1	2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Purchase portable generator to use to run the fresh water well pump during power outages		
Project Number:	2020-NUTLEY-015		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Township has a fresh water well available to residents. It provides clean drinking water for residents to fill up containers. In the event of a power outage, the pump is not available to use.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase a portable generator to use during power outages to allow the fresh water well pump to operate and provide clean drinking water to residents.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Drinking water during power outages
Useful Life:	5 years	Goals Met:	1, 2, 3
Estimated Cost:	\$10,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	1 year	Potential Funding Sources:	FEMA HMGP, Municipal Budget
Responsible Organization:	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
	Install solar panels	\$500,000	Weather dependent; not good for long-term power outages
	Install wind turbines	\$500,000	weather dependent; facility property would need open space for turbine
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Purchase portable generator to use to run the fresh water well pump during power outages	
Project Number:	2020-NUTLEY-015	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	0	Utility Interruption
Timeline	1	1 year
Agency Champion	1	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Stormwater Discharge Points Study		
Project Number:	2020-NUTLEY-016		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Severe Winter Weather, Utility Interruptions		
Description of the Problem:	There are several areas within the Township that experience flooding during heavy rain events (4"+ inches in short amount of time). The existing stormwater system is older. These areas are not adjacent to a body of water – identified as urban flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a study to look at all the stormwater discharge points (Bloomfield and Kingsland; Franklin Avenue; Hillside Avenue; and Elm Street) to see how the Township can redesign to create a positive discharge using natural conveyance of an existing waterway in the Township.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	To be determined after project is identified	Estimated Benefits (losses avoided):	Increase understanding of flood problems in Township; identify projects to alleviate this problem
Useful Life:	To be determined after project is identified	Goals Met:	1, 2, 6
Estimated Cost:	\$50,000-\$75,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	within 1 year of receiving funds
Estimated Time Required for Project Implementation:	Within 5 years	Potential Funding Sources:	FEMA FMA and HMGP
Responsible Organization:	DPW, Township Board	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 all buildings	\$1 million	Costly; might not be necessary
	Replace stormwater system	\$5 million+	costly; long-term project
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Stormwater Discharge Points Study	
Project Number:	2020-NUTLEY-016	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Project is cost effective; benefits outweigh the costs
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather, Severe Winter Weather, Utility Interruptions
Timeline	1	Within 5 years
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	



CITY OF ORANGE TOWNSHIP

MUNICIPALITY AT A GLANCE

Total Population: **30,731**
 Total Land Area: **2.2 sq mi**
 Total # Buildings: **3,890**



1% Annual Chance Flood



2,648

Population Residing
in Floodplain



226

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$2 Million

Potential Building Damages



\$32.3 Million

Potential
Building Damages



8

Critical Facilities
in Floodplain

NFIP Statistics



294 # NFIP
Policies

13 # SRL NFIP
Properties

1 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and Non-
Natural Hazards

Project Types

Property Protection, Public
Education/Awareness, Emergency
Services, Community Capacity Building

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9.18 CITY OF ORANGE TOWNSHIP

This section presents the jurisdictional annex for the City of Orange Township. The annex includes a general overview of the City of Orange Township; an assessment of the City of Orange Township’s risk and vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to hazards.

9.18.2 Hazard Mitigation Planning Team

The following individuals are the City of Orange Township’s identified hazard mitigation plan primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.18-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Raymond Wingfield, Assistant Director DPW/OEM Coordinator Address: Phone Number: 862-250-3140 Email: rwingfield@orangenj.gov	Name / Title: Elvin Padilla Jr., Fire Captain/OEM Deputy Coordinator Address: Phone Number: 973-747-9332 Email: epadillajr@orangenj.gov
NFIP Floodplain Administrator	
Name / Title: Pamela Hilla, Remington & Vernick Engineers Address: Phone Number: 732-286-9220 Email: pamela.jilla@rve.com	

9.18.3 Jurisdiction Profile

According to the U.S. Census Bureau, the city has a total land area of 2.2.01 square miles, of which 2.199 square miles is land and 0.002 square miles is water. The city is bordered to the west by West Orange, to the east by East Orange, and to the south by South Orange. The East Branch of the Rahway runs through Orange.

Originally known as the “Newark Mountains”, the City of Orange Township officially renamed in 1780 and became incorporated in 1860. Orange was once known as the hat manufacturing capital of the world. The location attracts small to medium sized businesses who find it affordable to operate and easy access to desirable markets (Welcome to the City of Orange Township, 2014).

According to the U.S. Census, the 2010 population for the City of Orange Township was 30,134. The estimated 2017 population was 30,731, which is a 2 percent increase in population from 2010. Data from the 2017 U.S. Census American Community Survey estimates that 7.9 percent of the City population is five years of age or younger, and 13.5 percent is 65 years of age or older. 5.3 percent of the population is estimated to be below the poverty line. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

The City of Orange Township operates with a directly elected Mayor, four- member City Council, and three at-large representatives (Welcome to the City of Orange Township, 2014).



9.18.4 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 9.2-2 summarizes recent and expected future development trends including major residential/commercial development and major infrastructure development. Refer to Figure 9.18-1 and Figure 9.18-2 at the end of this annex which illustrate the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.18-2. 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					
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					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					

* Only location-specific hazard zones or vulnerabilities identified.

9.18.5 Capability Assessment

The City of Orange Township performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. 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 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 Orange Township.



Table 9.18-3. 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 and State	Yes	No	No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Chapter 74 Construction Codes, Uniform. Administered by the Construction Office.</i>					
Zoning Code	Yes	Local and State	Yes	No	No
<i>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 210 Development Regulations. Administered by the Construction Office.</i>					
Subdivisions	Yes	Local and State	Yes	No	No
<i>Comment: 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 210 Development Regulations. Administered by the Construction Office.</i>					
Stormwater Management	Yes	Local	Yes	No	No
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 115 Illicit Connections to Municipal Storm Sewer System Prohibited; Chapter 175 Sewers; Chapter 210 Development Regulations. Administered by DPW.</i>					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	No
<i>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.</i>					
Growth Management	No	-	Yes	No	No
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	No
<i>Comment: Administered by the Construction Office.</i>					
Environmental Protection	Yes	Local	Yes	-	-
<i>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 46 Air Pollution; Chapter 181 Soil Removal.</i>					
Flood Damage Prevention	Yes	Local	No	No	No
<i>Comment: Chapter 95 Flood Damage Prevention, 2007.</i>					
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	Yes	Local	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: Chapter 18 Fire Department.					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	Yes	Local	-	-	-
Comment: Water Conservation Ordinance Number 12-2014.					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	No
Comment: City of Orange Township Master Plan, November 2018. Administered by the Planning Department. Includes elements for land use, housing, economic development, circulation, community facilities, sustainability, and historic preservation. The Plan also notes the relationship to other plans.					
Capital Improvement Plan	Yes	Local	Allowed	No	No
Comment: Per NJS 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/No		No	Yes/No	Yes/No
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	No	No
Comment: Watershed Management Plan					
Stormwater Management Plan	Yes	Local and State	Yes	Yes/No	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/No	Local and State	Yes	Yes/No	Yes/No
Comment:					
Urban Water Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Habitat Conservation Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Economic Development Plan	Yes	Local	No	Yes	No
Comment: Economic Development element in City of Orange Township Master Plan 2018.					
Shoreline Management Plan	No	-	No	-	-
Comment:					
Community Wildfire Protection Plan	Yes/No		No	Yes/No	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:					
Community Forest Management Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Transportation Plan	Yes	Local	No	Yes	No
Comment: Circulation element in the City of Orange Township Master Plan 2018.					
Agriculture Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Climate Action Plan	Yes	Local	No	Yes	No
Comment: Sustainability element in the City of Orange Township Master Plan 2018.					
Tourism Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Business Development Plan	Yes/No		No	Yes/No	Yes/No
Comment:					
Other	Yes/No		Yes/No	Yes/No	Yes/No
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes/No	Local	Yes	Yes/No	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.					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes/No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	Yes/No	Local	No	Yes/No	Yes/No
Comment:					
Continuity of Operations Plan	Yes/No	Local	No	Yes/No	Yes/No
Comment:					
Public Health Plan	Yes/No		Yes/No	Yes/No	Yes/No
Comment:					
Other	Yes/No		Yes/No	Yes/No	Yes/No
Comment:					



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/No
Does your jurisdiction have the ability to track permits by hazard area?	Yes/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.	Yes/No

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the City of Orange Township.

Table 9.18-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	-	
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	-	
Economic Development Commission / Committee	Yes	Department of Economic Development
Warning Systems / Services (reverse 911, outdoor warning signals)	-	
Maintenance program to reduce risk	Yes	Public Works
Mutual aid agreements	Yes	Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Engineers or professionals trained in building or infrastructure construction practices	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Planners or engineers with an understanding of natural hazards	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Staff with training in benefit/cost analysis	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Surveyors	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Personnel skilled or trained in GIS applications	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ



Staff/Personnel Resource	Available?	Department/Agency/Position
Scientist familiar with natural hazards in local area	No	Insert appropriate information
Emergency manager	Yes	Ray Wingfield, OEM Coordinator, City of Orange
Grant writers	Yes	Richard G. Arago, P.E., Executive Vice President, Remington, Vernick + Arango Engineers, Secaucus, NJ
Resilience Officer	Yes/No	Insert appropriate information
Other	Yes/No	Insert appropriate information

FISCAL CAPABILITY

The table below summarizes financial resources available to the City of Orange Township.

Table 9.18-6. 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/No
Development Impact Fees for Homebuyers or Developers	No
Other	Yes/No (if yes, specify)

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the City of Orange Township.

Table 9.18-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	-
Do you have personnel skilled or trained in website development?	-
Do you have hazard mitigation information available on your website? <ul style="list-style-type: none"> If yes, briefly describe. 	-
Do you use social media for hazard mitigation education and outreach? <ul style="list-style-type: none"> If yes, briefly describe. 	Yes: Facebook, YouTube, Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? <ul style="list-style-type: none"> If yes, briefly describe. 	-
Do you have any other programs already in place that could be used to communicate hazard-related information? <ul style="list-style-type: none"> If yes, briefly describe. 	-



Do you have any established warning systems for hazard events? • If yes, briefly describe.	-
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COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the City of Orange Township.

Table 9.18-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	12/19/2017

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 referred to while discussing climate change adaptation; however, it also provides 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.

Table 9.18-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium
Earthquake	Low
Extreme Temperature	High
Flood	Low
Geological Hazards	Low
Severe Weather	High
Winter Storm	High
Wildfire	High
Civil Disorder	Medium
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Medium
Hazardous Substances	Low
Utility Interruption	High
Terrorism	Medium
Transportation Failure	Low



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 9.18-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Pamela Hilla, Remington & Vernick
Are any certified floodplain managers on staff in your jurisdiction?	-
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?	-
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAV: 7/20/1993; CAC: 5/15/2007
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	???
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.	-
Does your floodplain management staff need any assistance or training to support its floodplain management program?	-
<input type="checkbox"/> 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?*	284, \$65,594 insurance in force, \$512,438 in premiums
How many total loss claims have been filed in your jurisdiction?*	163 total loss claims, 43 claims open or closed without payment, \$963,709.02 total payments for losses
• How many claims are still open or were closed without payment? • What were the total payments for losses?	
Do you maintain a list of properties that have been damaged by flooding?	-
Do you maintain a list of property owners interested in flood mitigation?	-

*According to FEMA statistics as of 03/31/2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the City of Orange Township made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the hazard mitigation plan and strategy:

- **Division of Environmental Services:** Environmental services include:





- Hazardous Substance Response: Releases of hazardous substances into the air, waters or on land are investigated in conjunction with the Essex Regional Health Commission and according to our emergency management plan.
- Emergency Management: The staff is available for response at all times through central dispatch at the Police Department. The Health Department participates as a member of the emergency management board for the Township, and develops and updates the annexes for which this department is responsible.
- **Department of Public Works:** The Department of Public Works' responsibilities include administering the following Divisions:
 - Street Maintenance - The Division maintains (including snow plowing and snow removal) all municipal roads. It cleans and sweeps improved roads and is responsible for the installation and maintenance of traffic signs (street names, Stop, No Turn on Red, and No Parking signs, etc.). The Division is also responsible for road markings, including crosswalks, fire lanes and parking stalls.
 - The Division maintains the upkeep of 8 city parks totaling 12 acres, as well as City-owned lots, and three in-ground swimming pools. It is responsible for the planning, care of more than trees along public streets, as well as trees, shrubs and flowers in municipal parks and on public grounds.
 - The Division is in charge of preventive maintenance and repair of municipally-owned vehicles and other mechanical equipment used by the DPW, police, fire and recreation departments.
 - The Division is responsible for maintaining public facilities. These include the lighting in all municipal parking lots and all athletic fields (basketball, tennis and baseball); the fire alarm systems in all municipal buildings; the water lines at the municipal buildings, ball fields and parks; all fire extinguishers; fencing; parking lot meters; all park benches; the heating, air-conditioning and plumbing systems, and meters in all municipal buildings. The division is also responsible for shoveling snow from the walks of all public buildings; setting up the Council Chambers for Council meetings, various boards and Municipal Court sessions. The division installs and removes holiday decorations and lights in the business downtown business districts for the Urban Enterprise Zone.
 - Snow Removal – All DPW divisions participate in the salting and plowing of municipal streets and roadways during snow and ice storms.
 - Utilities – DPW coordinates with utility providers of gas, electricity, and water to ensure that all areas of the city are receiving services, and to resolve problems that may occur due to storms and other emergencies.
- **Department of Economic Development:** The function of the Department of Planning Administration is to advise the Mayor, City Council, Planning Board, and the Zoning Board on planning issues affecting the physical development of the City. The Division prepares, maintains, and updates the City's Master Plan, and recommends changes to the City's Zoning Ordinance. The Master Plan is based on three principals - sustainable development & redevelopment; managed growth; and, a healthy community
- **Department of Planning and Development:** The purpose of the Planning and Development Department is to plan, organize, lead, control, and deliver housing and economic development services to meet the needs of the private and public sector of Orange's economy.
- **Orange Fire Department:** The Orange Fire Department responds to the building fires, smoke conditions, vehicle and brush fires, electrical and water emergencies, vehicle accidents and extrications, hazardous materials problems, medical emergencies and mutual aid calls to neighboring communities. The Fire Department is the enforcement Agency for the City's Fire Code, which is aimed at controlling potential hazards in all structures in the community.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and



economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

- **Sustainable Jersey:** The City of Orange Township is a bronze certified community in the Sustainable Jersey program. The City earned points towards certification for green building policy, green design commercial and residential buildings, site plan green design standards, building healthier communities, sustainable land use, transit-oriented development supportive zoning, a water conservation ordinance, green grounds and maintenance policy, and digitizing public information.

9.18.6 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Volume I, Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles (Section 4.3) and includes a chronology of events that have affected Essex County and its jurisdictions. The City of Orange Township’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.18-11 provides details regarding municipal-specific loss and damages the City experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources. For details of these and additional events, refer to Volume I, Section 4 (Risk Assessment) of this plan.

Table 9.18-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	<p>Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and</p>	Governor Chris Christie declared a state of emergency for New Jersey on Friday January 22nd. New Jersey Transit stopped running trains, buses and light rail at 2 AM Saturday January 23rd.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			into the early evening on Saturday January 23rd.	

-

9.18.7 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 9.18-12 summarizes risk assessment results used to inform the hazard ranking for the City of Orange Township. For additional vulnerability information relevant to this jurisdiction, refer to Section 4 (Risk Assessment).



Table 9.18-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,988,910	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$15,294,256	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	0	NEHRP D&E:	0	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$2,661,345	
						2,500-year Loss:	\$43,623,386	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,161	Physical 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.		Low
		Population Below Poverty Level:	7,381					
Flood	100- and 500-Year Mean Return Period Event	100-year	2,648	100-year	378	100-year Loss:	\$32,313,694	High
		500-year	2,648	500-year	378			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	\$0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County; Orange has 1	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
Utility Interruption	Disruption of power and potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

Source: Essex County, 2019; FEMA 2014/2017/2018; HAZUS-MH v4.2



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the City of Orange Township.

- Number of repetitive loss (RL) properties: 13
Number of severe repetitive loss (SRL) properties: 1
Number of RL/SRL properties that have been mitigated: 0

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 floodplains and the status of mitigation at each location. If a new mitigation action is identified, the mitigation action ID is listed; refer to Table 9.18-16 for additional details regarding the project.

Table 9.18-13. Potential Flood Losses to Critical Facilities

Table with 5 columns: Name, Type, Exposure (1% Event, 0.2% Event), Status of Mitigation. Rows include Orange Bus Garage, Orange PSE&G Power Substations, ESCO Equipment Storage Facility, ECSO Equipment Storage Facility, Orange Water Pumping Station, Essex Campus Academy, Madrasatu Bait, and Fuelco Gas Station-Orange.

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

- Flooding during heavy rain fall leads to road closure in residential area.
The city needs cooling and warming shelters.
Transportation is an issue during winter storms.
Outreach is needed for severe storms.
Need portable generators.
Numerous critical facilities are located in the 100-year floodplain including: Orange Bus Garage, PSE&G Power Substation at 420 Thomas Blvd, ESCO Equipment Storage Facility, Orange Water Pumping Station at Gist Place, Essex Campus Academy, Madrasatu Bait School, Fuelco Gas Station at 455 Thomas Blvd. ESCO Equipment Storage Facility has been identified as a lifeline facility.
The City of Orange has 14 repetitive loss properties and one severe repetitive loss property.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps have been generated for the City of Orange Township 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 considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the City of Orange Township has significant exposure; refer to Figures 9.18-1 and 9.18-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as 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 Essex 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 for the City of Orange Township. During the review of the calculated hazard ranking, the City adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The City of Orange Township has reviewed the 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 calculated hazard ranking of wildfire from low to high.
- The City changed the calculated hazard ranking of civil disorder from low to medium.
- The City changed the calculated hazard ranking of cyber-attack from low to medium.
- The City changed the calculated hazard ranking of terrorism from low to medium.

Table 9.18-14. City of Orange Township Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	High	Low
Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	High	Medium	Medium
Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Medium	Low



9.18.8 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their 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 9.18-15. 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 #
Orange-1: City of Orange water well pumps	City OEM	-	X	2020-Orange-005
Orange-2: City of Orange flood easement project to address stormwater runoff	City OEM	In Progress		
Orange-3: "Obtain back-up power and install to ensure continuity of operations. The following facilities are identified at this time: 1. Orange City Hall generator 2. City of Orange Fire Department generator 3. Water pumping station #2 4. Water pumping station #3 5. Water pumping station #4 6. City Hall 7. Orange Fire Headquarters 8. Orange Fire Station #2"	City OEM	In Progress - City Hall, Fire Department, Water pumping stations, and Fire HQ received generators. Fire Station #2 still requires generator.	X	2020-Orange-001
Orange-4: Obtain flood easements. 1.Lakeside Avenue/High Street 2.Valley Area 3.Central Avenue (West Orange border) 4.Central Avenue (East Orange border)	City DPW	In Progress		
Orange-5: Further secure Orange Park wells and Gist Place wells (such as cameras, security, etc.)	United Water Company	In Progress		
Orange-6: The hazard mitigation plan will be used to guide the addition of hazard information for inclusion in the next Master Plan update.	City Planning	Ongoing	X	2020-Orange-005
Orange-7: 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. Assess and prioritize non-structural flood hazard mitigation	FPA	In Progress	X	2020-Orange-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 #
alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation depending on feasibility. The parameters for feasibility for this initiative would be funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available.				

The City did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The City of Orange Township participated in a risk assessment workshop in September 2019 where detailed information was provided on assets exposed and vulnerable to the identified hazards of concern. The City of Orange Township and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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). Refer to Section 6 and Appendix H (Mitigation Strategy Supplement) for a more complete description of the Mitigation Toolbox and its resources.

Table 9.18-16 summarizes the comprehensive-range of specific mitigation initiatives the City of Orange Township would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’

Table 9.18-17 provides a summary of the prioritization of all proposed mitigation initiatives for the HMP update and Table 9.18-18 summarizes the actions by type across hazards of concern.



Table 9.18-15. 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-Orange-001	Generator for Fire Station #2	Fire Station #2 does not have backup power	Purchase and install generator and components for Fire Station #2	Existing	Utility Interruption	6	<u>Fire Department</u>	Assistance to Firefighters Grants, HMGP	Prevents power loss, protects critical services	\$30,000	Within 5 years	High	SIP	PP
2020-Orange-002	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages in the _____ area. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. The city has 14 repetitive loss properties and one severe repetitive loss property.	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	Existing	Flood, Severe Storm	2	<u>NFIP Floodplain Administrator</u> , 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.	\$3 million	3 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
2020-Orange-003	Establish Warming/Cooling Shelters	The city lacks warming and cooling shelters	The city will establish warming/cooling shelters at already established facilities.	Existing	Extreme Temperature	1, 5	<u>OEM</u>	Municipal budget	Shelters established	\$5,000	Within 5 years	High	LPR, SIP	ES
2020-Orange-004	Outreach to non-city owned critical facilities in floodplain and critical facilities exposed to other hazards	Numerous critical facilities in the floodplain are not owned by the city: Orange Bus Garage, PSE&G Power Substation at 420 Thomas Blvd, ESCO Equipment Storage Facility, Essex Campus Academy, Madrasatu Bait School, Fuelco Gas Station at 455 Thomas Blvd.	The FPA will conduct outreach to facility owners and discusses options for mitigation.	Existing	All hazards	3, 4	<u>FPA</u>	Municipal budget	Facility owners educated on potential mitigation options	\$100 per facility.	6 months	High	EAP	PI
2020-Orange-005	Protect Orange Water Pumping Station at Gist Place	Orange Water Pumping Station at Gist Place is located in the 100-year floodplain.	The city will conduct a feasibility assessment to determine the level of exposure and mitigation options. The city will then implement the selected action.	Existing	Flood	2, 6	<u>Engineering</u>	Municipal budget, HMGP	Facility protected from future flood damages.	TBD by feasibility assessment	5 years	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
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. Such 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. These 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. Such 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 9.18-17. 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-Orange-001	Generator for Fire Station #2	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-Orange-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-Orange-003	Establish Warming/Cooling Shelters	1	0	1	1	1	1	1	1	1	1	0	0	1	1	11	High
2020-Orange-004	Outreach to non-city owned critical facilities in floodplain and critical facilities exposed to other hazards	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2020-Orange-005	Protect Orange Water Pumping Station at Gist Place	1	1	0	1	1	1	0	1	1	1	0	0	1	1	10	High

Note (1): Refer to Section 6, which conveys guidance on prioritizing mitigation actions.

Note (2): Low (0-4), Medium (5-8), High (9-14).



Table 9.18-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise			2020-Orange-004					2020-Orange-004
Coastal Storm			2020-Orange-004					2020-Orange-004
Drought			2020-Orange-004					2020-Orange-004
Earthquake			2020-Orange-004					2020-Orange-004
Extreme Temperature			2020-Orange-004		2020-Orange-003			2020-Orange-004
Flood		2020-Orange-002, 2020-Orange-005	2020-Orange-004					2020-Orange-004
Geological Hazards			2020-Orange-004					2020-Orange-004
Severe Weather		2020-Orange-002	2020-Orange-004					2020-Orange-004
Winter Storm			2020-Orange-004					2020-Orange-004
Wildfire			2020-Orange-004					2020-Orange-004
Civil Disorder			2020-Orange-004					2020-Orange-004
Cyber Attack			2020-Orange-004					2020-Orange-004
Disease Outbreak			2020-Orange-004					2020-Orange-004
Economic Collapse			2020-Orange-004					2020-Orange-004
Hazardous Substances			2020-Orange-004					2020-Orange-004
Utility Interruption		2020-Orange-001	2020-Orange-004					2020-Orange-004
Terrorism			2020-Orange-004					2020-Orange-004
Transportation Failure			2020-Orange-004					2020-Orange-004

Refer to Section 6 (Mitigation Strategy) for an explanation of the mitigation categories.

9.18.9 Staff and Local Stakeholder Involvement in Annex Development

The City of Orange Township followed the planning process described in Section 2 (Planning Process) in Volume I of this plan update. 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.18-19. Contributors to the Annex

Entity	Title	Method of Participation
Raymond Wingfield	Assistant Director DPW/OEM Coordinator	Primary point of contact, provided impact data
Elvin Padilla Jr	Fire Captain/OEM Deputy Coordinator	Alternate point of contact, attended Planning Partnership meetings, provided impact data
Pamela Hilla	Remington & Vernick Engineers	

Figure 9.18-1. City of Orange Township Hazard Area Extent and Location Map

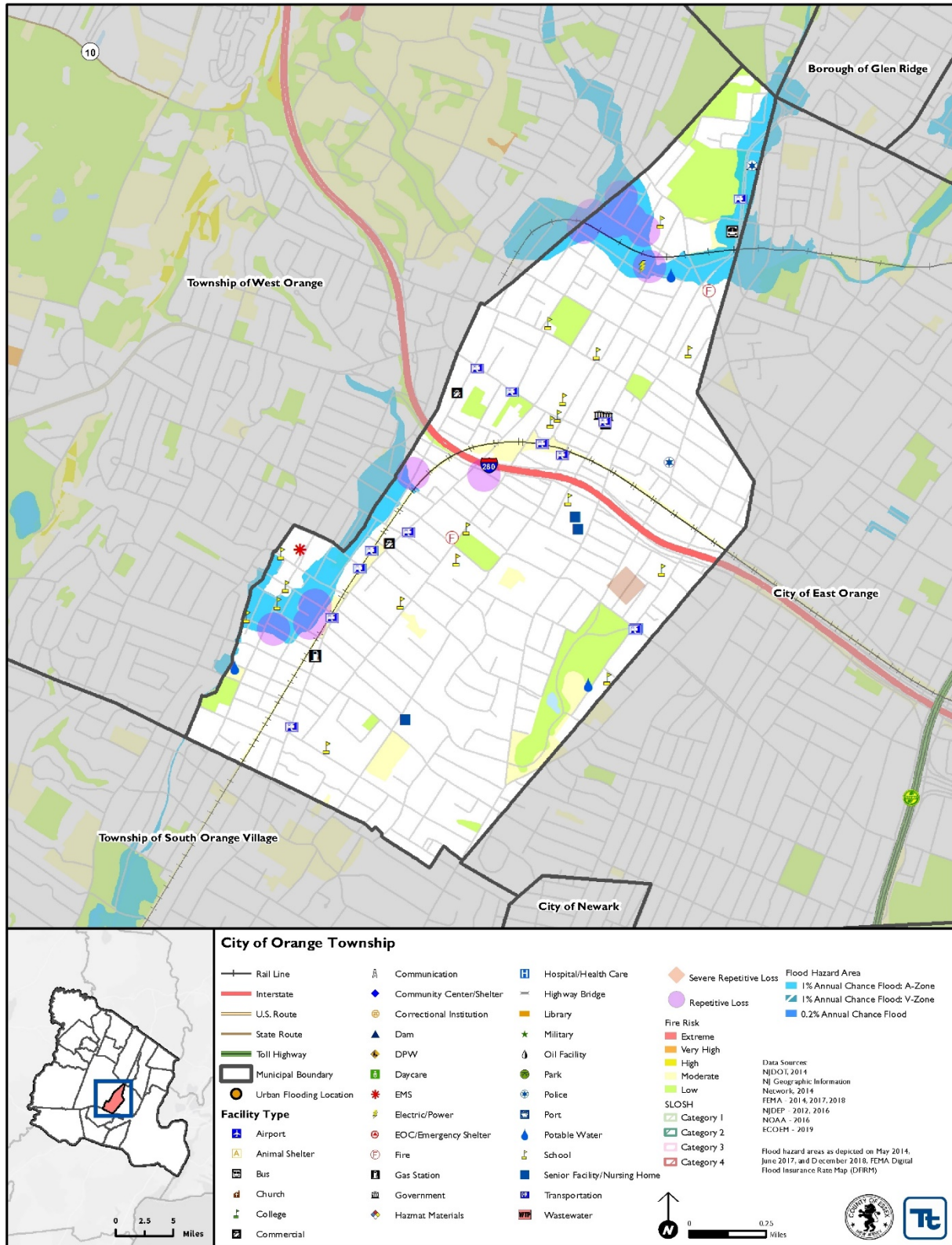
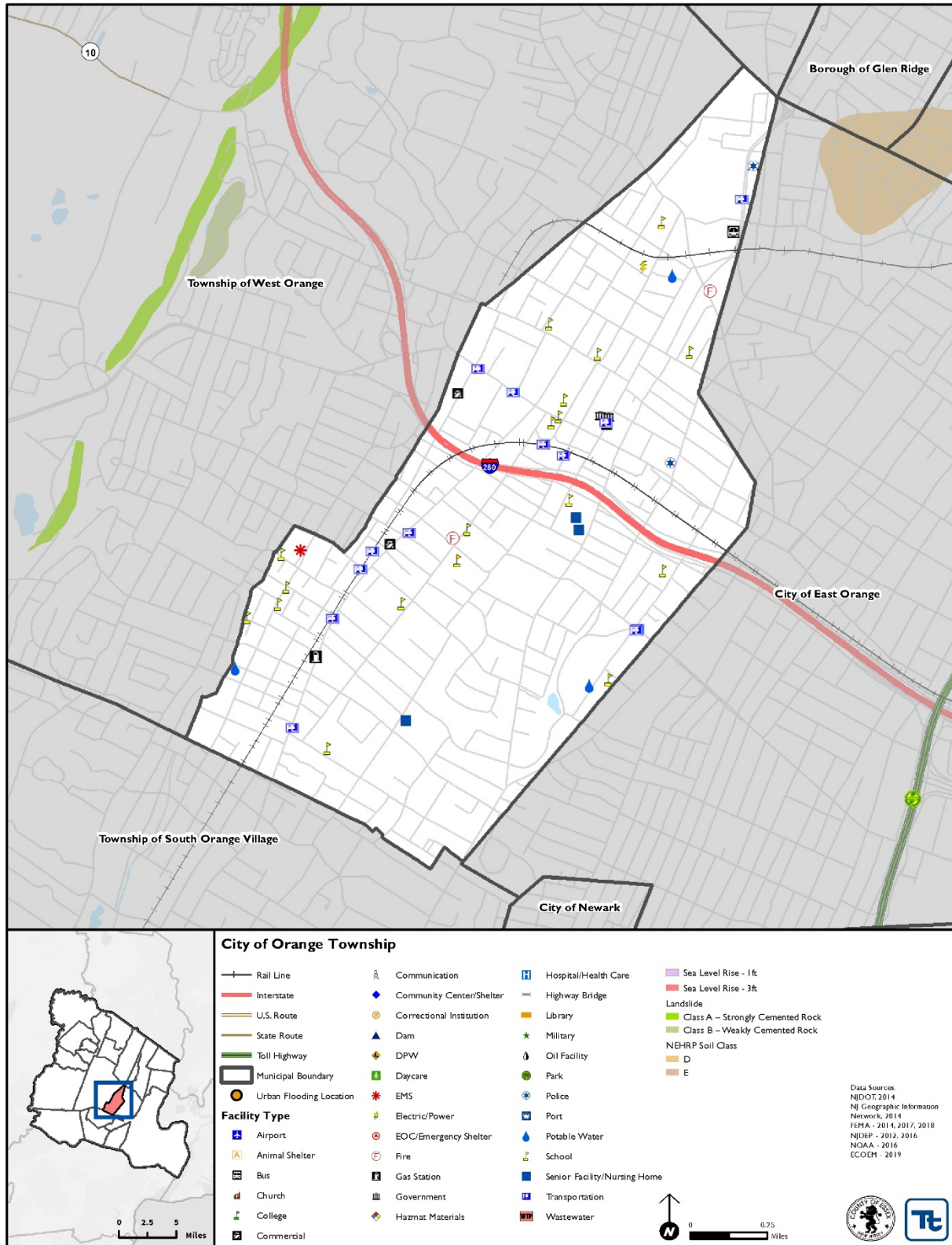


Figure 9.18-2. City of Orange Township Hazard Area Extent and Location Map 2





Name of Jurisdiction: _____
 Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Generator for Fire Station #2		
Project Number:	2020-Orange-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	Fire Station #2 does not have backup power		
Action or Project Intended for Implementation			
Description of the Solution:	The City of Orange will determine the appropriately sized generator needed. The City will then purchase and install the generator and components for Fire Station #2.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	N/A	Estimated Benefits (losses avoided):	Ensures continuity of operations; provides a shelter for residents
Useful Life:	20 years	Goals Met:	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:	Firefighter Assistance 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
	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:			



Name of Jurisdiction: _____
 Name and Title Completing Worksheet: _____

Action Worksheet		
Project Name:	Generator for Fire Station #2	
Project Number:	2020-Orange-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will protect critical services of Fire Station.
Property Protection	1	Project will protect Fire Station from power loss.
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	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	1 year
Agency Champion	1	Fire Department
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



Name of Jurisdiction: _____
 Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Orange-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the _____ area. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims. The city has 14 repetitive loss properties and one severe repetitive loss property.		
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 _____ area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard (<i>in accordance with flood ordinance</i>)	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:	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:			

Name of Jurisdiction: _____





Name and Title Completing Worksheet: _____

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Orange-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 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 _____ area 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	

Name of Jurisdiction: _____





Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Protect Orange Water Pumping Station at Gist Place		
Project Number:	2020-Orange-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The Orange Water Pumping Station at Gist Place is located in the 100-year floodplain. The level of exposure to flood damages is unknown.		
Action or Project Intended for Implementation			
Description of the Solution:	The City will conduct a feasibility assessment to determine the level of exposure and mitigation options to protect the facility to the 500-year flood level. The City will then implement the selected action.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	500-year flood	Estimated Benefits (losses avoided):	Facility protected to 500-year flood level
Useful Life:	TBD by feasibility assessment	Goals Met:	2, 6
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:	5 years	Potential Funding Sources:	Municipal budget, HMGP
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
	Relocate water pumping station	N/A	No space available for relocation
	Remove water pumping station entirely	N/A	Water utility cannot support capacity requirements without pump station
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Name of Jurisdiction: _____

Name and Title Completing Worksheet: _____





Action Worksheet		
Project Name:	Protect Orange Water Pumping Station at Gist Place	
Project Number:	2020-Orange-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project protects critical service of water supply
Property Protection	1	Project protects facility from flood damage
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	0	Flood
Timeline	0	Within 5 years
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



BOROUGH OF ROSELAND

MUNICIPALITY AT A GLANCE

Total Population: **5,907**

Total Land Area: **3.7 sq mi**

Total # Buildings: **1,794**



1% Annual Chance Flood



132

Population Residing
in Floodplain



3

Persons That
May Seek Shelter



\$1.2 Million

Potential
Building Damages



3

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$826 Thousand

Potential Building Damages

NFIP Statistics



24 # NFIP
Policies

2 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and Non-
Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resource
Protection, Emergency Services,
Structure Projects, Climate Resilience,
Community Capacity Building

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9.19 BOROUGH OF ROSELAND

This section presents the jurisdictional annex for the Borough of Roseland. The annex includes a general overview of the Borough; an assessment of the Borough of Roseland’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 hazards.

9.19.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Roseland’s identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.19-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Gary Schall / Superintendent DPW Address: Roseland Borough Hall, 19 Harrison Ave., Roseland NJ 07068 Phone Number: 973-403-6049 Email: gschall@roselandnj.org	Name / Title: Tom Jacobsen / Construction Official Address: Roseland Borough Hall, 19 Harrison Ave., Roseland NJ 07068 Phone Number: 973-403-6048 Email: construction@roselandnj.org
NFIP Floodplain Administrator	
Name / Title: Joseph A. Pomante, PE, CFM / Borough Engineer, Boswell Engineering Consulting Address: Roseland Borough Hall, 140 Eagle Rock Ave., Roseland NJ 07068 Phone Number: 973-226-6565 Email: engineerofficial@roseland.org	

9.19.2 Jurisdiction Profile

According to the U.S. Census Bureau, the Borough has a total land area of 3.56 square miles, of which 3.539 square miles is land and 0.021 square miles is water. The Borough of Roseland is in the center of the western edge of Essex County and is bordered to the north by the Township of Essex Fells, to the east by the Township of West Orange, to the south by the Township of Livingston, and to the west by Morris County municipality of East Hanover.

Roseland became independent of Livingston in 1908 with the assistance of Bill Teed. With the increasing size of Roseland’s population, the people needed more resources than Livingston was willing to provide. The development of Roseland is attributed to the impact of the Becker Farm with the nearly 1,200 acres it once occupied. This area is now home to many large corporate office complexes and Residential Condominium Complexes (Borough of Roseland, 2014). Roseland Borough operates using a Borough form of government with a Mayor, Council, and Administrator (Borough of Roseland, 2014).

According to the U.S. Census, the 2010 population for the Borough of Roseland was 5,819. The estimated 2017 population was 5,907, a 1.5 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 3.9 percent of the population is 5 years of age or younger and 24.6 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.



9.19.3 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 9.19-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.19-1 and Figure 9.19-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.19-2. Recent and Expected Future Development

Type of Development	2015	2015	2017	2018	2019
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	7	2	1	1	
Multi-Family	26				
Other (commercial, mixed-use, etc.)	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					
Avalon Bay at Roseland	136 Apartments Townhouse Style	136 Apartment-Townhome-style in 26 buildings / 2 other buildings on site for other use.	55 Locust Avenue Blk 32/Lot 13	None	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
6 Becker Farm Rd	299 Apartments 4 stories high	299 Apartments /Pool/Dog Park	6 Becker Farm Rd Blk 30/Lot 2	None	Not Started
85 Livingston Avenue	120 Room Hotel/Rest/130 Apartments	Hotel Apartments Restaurant	85 Livingston Ave Blk 30.1/Lot 14	None	Not Started
146 Harrison Avenue Multi-Family	211 Rental Townhouse Apartments	Residential 211 housing units	146 Harrison Ave Blk 21 / Lot 22.04	None	Not Started
146 Multi-Family	65 Apartments Age Restricted	65 Rental Units Apartments	146 Harrison Ave Block 12 / Lot 22.04	None	Not Started
117 Harrison Avenue Multi-Family and Town Homes Rental	138 Town homes as rentals	138 Residential Town Homes for rent	117 Harrison Ave Blk 21/Lot 22.01 Blk 21/ Lot 22	None	Not Started

* Only location-specific hazard zones or vulnerabilities identified.

9.19.4 Capability Assessment

The Borough of Roseland 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 Roseland.

Table 9.19-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Borough of Roseland	Construction	State inspects where local inspectors cannot.	Yes	Yes	No
<i>Comment: Chapter X Building and Housing, 1973 and updated regularly. Elevator Inspection is completed by State.</i>							
Zoning Code	Yes	Borough of Roseland	Zoning	No	Yes	No	No
<i>Comment: Chapter XXX Land Development, adopted October 23, 1990 by Ordinance No. 27-1990. Subsequent ordinance amendments are noted where applicable. Ordinance No. 13-2000, adopted July 11, 2000 has not been codified herein and was reenacted by Ordinance No. 6-2001, adopted February 27, 2001.</i>							
Subdivisions	Yes	Borough of Roseland	Zoning	No	Yes	No	No
<i>Comment: Chapter XXX Land Development, adopted October 23, 1990 by Ordinance No. 27-1990. Subsequent ordinance amendments are noted where applicable. Ordinance No. 13-2000, adopted July 11, 2000 has not been codified herein and was reenacted by Ordinance No. 6-2001, adopted February 27, 2001. Adopted June 1, 2006.</i>							
Stormwater Management	Yes	Borough of Roseland	Engineering	NJDEP	Yes	No	No
<i>Comment: Chapter XVII Water and Sewer, Article VI Storm Sewer System</i>							
Post-Disaster Recovery	No	-	-	-	No	-	-
<i>Comment: No Official Local Ordinance.</i>							
Real Estate Disclosure	No	-	-	-	No	-	-
<i>Comment: All information is subject to OPRA but will not show everything regarding the Real Property, only that requiring permits. Water and Sewer information might also be available on some properties.</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Growth Management	Yes	Borough of Roseland	Planning Board, Master Plan Committee	No	Yes	No	No
<i>Comment: Element of the Master Plan.</i>							
Site Plan Review	Yes	Borough of Roseland, Essex County	Zoning, Planning Board	Technical Review Committee	Yes	No	No
<i>Comment: Chapter XXX Land Development. adopted October 23, 1990 by Ordinance No. 27-1990. Subsequent ordinance amendments are noted where applicable. Ordinance No. 13-2000, adopted July 11, 2000 has not been codified herein and was reenacted by Ordinance No. 6-2001, adopted February 27, 2001. Due to be amended again in 2020.</i>							
Environmental Protection	No	-	-	-	No	-	-
<i>Comment: Limited to the State Requirements only, no local ordinance.</i>							
Flood Damage Prevention	Yes	Borough of Roseland	Engineering/ Public Works	FEMA	Yes	Yes	No
<i>Comment: Chapter XXII Flood Damage Prevention. Ord. No. 20-2001. Roseland has recognized the need for proper floodplain management, and the community adopted a resolution on April 15, 1975. This resolution established land use and control measures to reduce all new construction or substantial improvements, including prefabricated and mobile homes. Any new construction or substantial improvements are to be made reasonably safe from flooding and to be located so as to minimize flood damage (FEMA FIS 2014).</i>							
Emergency Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Reconstruction Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Other	No	-	-	-	No	-	-
<i>Comment:</i>							
Planning Documents							
Comprehensive / Master Plan	Yes	Borough of Roseland	Planning Board	No	Yes	No	Yes
<i>Comment: Borough of Roseland Master Plan and Updates 1982-2011 https://www.roselandnj.org/boards_and_committees/planning_board/borough_of_roseland_master_plan.php. Integration in 2020-ROSELAND-007.</i>							
Capital Improvement Plan	Yes	Borough of Roseland	Administration	No	No	No	No
<i>Comment: Updated annually.</i>							
Disaster Debris Management Plan	Yes	-	-	-	No	-	-
<i>Comment: Handled by Public Works using the temporary disposal site</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	-	-
<i>Comment: All guidelines for Passaic River Basin are observed</i>							
Stormwater Management Plan	Yes	Borough of Roseland	DPW, Engineering	State	Yes	No	No
<i>Comment: Stormwater Management Plan fax 04-26-2007 is available at https://www.roselandnj.org/departments/public_works/stormwater_management.php.</i>							
Stormwater Pollution Prevention Plan	Yes	Borough of Roseland	DPW, Engineering	State	Yes	No	No
<i>Comment: Stormwater Pollution Prevention Plan 1-26-2005 available at https://www.roselandnj.org/departments/public_works/stormwater_management.php.</i>							
Urban Water Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Habitat Conservation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Economic Development Plan	Yes	-	-	-	No	-	-
<i>Comment: Redevelopment Plan has been initiated and is a fluid plan</i>							
Shoreline Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Community Wildfire Protection Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Forest Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Transportation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Agriculture Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Business Development Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Other	No	-	-	-	No	-	-
<i>Comment:</i>							
Response/Recovery Planning							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Yes	Borough of Roseland, Essex County	OEM	Essex County, State	Yes	Yes	No
<i>Comment: Emergency Operations Plan 2017. Plan updated every five years.</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	No	-	-
<i>Comment:</i>							
Post-Disaster Recovery Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Continuity of Operations Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Public Health Plan	Yes	Local	Health Department	No	No	No	No
<i>Comment:</i>							
Other	No	-	-	-	No	-	-
<i>Comment:</i>							

Table 9.19-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Planning Board
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 Open Space Plan includes list

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Roseland.

Table 9.19-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-





Staff/Personnel Resource	Available?	Department/Agency/Position
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	SwiftReach
Maintenance program to reduce risk	Yes	Culvert cleaning performed prior to and after event.
Mutual aid agreements	No	Fire and First Aid Only-
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	DPW, Engineering. Consultants
Engineers or professionals trained in building or infrastructure construction practices	Yes	Consulting Engineer, Construction Official
Planners or engineers with an understanding of natural hazards	Yes	Borough & Board Engineer Consultant
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	Consulting Engineer
Surveyors	Yes	Consulting Engineer
Stormwater Engineer	Yes	Consulting Engineer
Personnel skilled or trained in GIS applications	Yes	Consulting Engineer
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM Coordinator
Watershed Planner	No	-
Environmental Specialist	Yes	Consulting Engineer
Grant writers	Yes	Consulting Engineer
Resilience Officer	No	-
Other: 3 personnel trained in conducting damage assessments.	Yes	Construction Official

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Roseland.

Table 9.19-6. 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, through specific assessment
User Fees for Water, Sewer, Gas or Electric Service	Yes (Sewer \$400/year/user, water billed per usage)
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	When Permitted to do so
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 Roseland.

Table 9.19-7. 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?	Yes, Essex county Only
<ul style="list-style-type: none"> If yes, briefly describe. 	The Essex County All Hazard Mitigation Up Date Plan
Do you use social media for hazard mitigation education and outreach?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Police officer maintains Facebook, SwiftReach, and website.
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	No

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Roseland.

Table 9.19-8. 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	Unknown
Storm Ready Certification	No	-	-
Firewise Community Classification	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.

Currently, the municipality does not have access to resources to determine the possible impacts of climate change upon the municipality, the administration is not supportive of integrating climate change in policies or actions, and climate change is not being integrated into policies/plans or actions (projects/monitoring) within the municipality. Table 9.19-9 summarizes the adaptive capacity for climate change and the jurisdiction’s rating.



Table 9.19-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Low
Severe Storm	Medium
Winter Storm	Medium
Wildfire	Low
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Low
Hazardous Substances	Low
Utility Interruption	Medium
Terrorism	Low
Transportation Failure	Low

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 9.19-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (department/position)	Borough Engineer Section 22-9.1 of the Local Code identifies the Construction Code Official as the floodplain manager. Responsibilities of the floodplain administrator include permit reviews for new development. The Borough is looking to update ordinance.
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date that your flood damage prevention ordinance was last amended?	2001, 2007, proposed 2019
Does your floodplain management program meet or exceed minimum requirements?	Meets
<ul style="list-style-type: none"> If exceeds, in what ways? 	-
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC 05/01/2018



Criterion	Response
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
<ul style="list-style-type: none"> If so, state what they are. 	-
Are any RiskMAP projects currently underway in your jurisdiction?	Yes
<ul style="list-style-type: none"> If so, state what they are. 	Updating for LOMAs
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
<ul style="list-style-type: none"> If no, state why. 	-
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
<ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	Superintendent's office would like additional training.
Does your jurisdiction participate in the Community Rating System (CRS)?	No
<ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? 	N/A
<ul style="list-style-type: none"> If no, is your jurisdiction interested in joining the CRS program? 	No
How many flood insurance policies are in force in your jurisdiction?	24
What is the insurance in force?	7,400,700
What is the premium in force?	24,113
How many total loss claims have been filed in your jurisdiction?	19
How many claims are still open or were closed without payment?	4
<input type="checkbox"/> What were the total payments for losses?	\$180,672
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

*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.

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough of Roseland made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- The 2017 EOP integrates the following elements of the HMP:
 - Basic Plan
 - Alerting, Warning and Communications
 - Damage Assessment
 - Emergency Medical
 - Emergency Operations Center
 - Emergency Public Information
 - Evacuation
 - Fire and Rescue
 - Hazardous Materials
 - Law Enforcement
 - Public Health
 - Public Works



- Radiological Protection
- Resource Management
- Shelter, Reception and Care
- Social Services

9.19.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Borough of Roseland’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.19-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.19-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard DR-4264	Yes	Low pressure moving across the deep South on Thursday, January 21 and Friday, January 22 intensified and moved off the Mid Atlantic coast on Saturday, January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. More than 1,000 flights out of area airports were cancelled, and Teterboro Airport were shuttered due to whiteout conditions. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.	The Borough did not report any losses for this event.
March 14, 2017	Winter Storm	No	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. Trained spotters and the public reported 8 to 13 inches of snow and sleet.	The Borough did not report any losses for this event.
January 4, 2018	Winter Storm	No	The development of the blizzard/winter storm began along the southeast coast on Wednesday January 3, 2018. An amplifying upper level trough spawned the development of low pressure off the coast of Florida. The low pressure rapidly intensified on Wednesday night through Thursday January 4, 2018 as it moved north-northeast along	The Borough did not report any losses for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			the coast. The FAA Contract Observer at nearby Newark-Liberty Airport reported 8.4 inches of snowfall. Winds also gusted to 44 MPH at 4:38 PM at the airport.	
March 7, 2018	Winter Storm	No	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. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. Trained spotters and the public reported 1 to 2 feet of snow. 23.0 inches was reported in North Caldwell and 19.7 inches in Roseland. The heavy wet snow and strong winds also brought down trees and some power lines.	The Borough did not report any losses for this event.
November 15, 2018	Winter Storm	No	A wave of low pressure developed along the Middle Atlantic coast during Thursday November 15, 2018. The low was associated with a closed upper level trough across the Midwest. As the trough translated eastward into Friday November 16, 2018, the low pressure moved up the northeast coast. The moderate to heavy wet snowfall significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, which caused many power outages. Numerous accidents were reported, and many motorists were stranded on roads until the early morning hours the next day. The FAA contract observer at nearby Newark Airport reported 6.4 inches of snow.	The Borough did not report any losses for this event.
January 30, 2019	Strong Wind	No	Strong winds occurred behind low pressure and cold front. The ASOS at Caldwell Airport measured a 30 mph sustained wind at 504 pm. \$10K in property damages were reported.	The Borough did not report any losses for this event.

9.19.6 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 9.19-12 summarizes the risk assessment results used to inform the Borough of Roseland hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each



hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Roseland.

- 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

RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).



Table 9.19-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$826,293	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$5,555,768	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500- Year Mean Return Period Event	NEHRP D&E:	916	NEHRP D&E:	278	100-year Loss:	\$0	High
		Liquefaction Class 4:	3	Liquefaction Class 4:	1	500-year Loss:	\$1,626,070	
						2,500-year Loss:	\$26,072,734	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,456	Physical 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.		Low
		Population Below Poverty Level:	219					
Flood	100- and 500-Year Mean Return Period Event	100-year	132	100-year	40	100-year Loss:	\$1,173,160	High
		500-year	277	500-year	84			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	13	Class B:	4	Class B:	\$2,150,840	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	3	Wildfire:	1	Wildfire:	\$6,477,522	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	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
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



CRITICAL FACILITIES

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplains and the status of mitigation at each location. If a new mitigation action is identified, the mitigation action ID is listed; refer to Table 9.19-16 for additional details regarding the project.

Table 9.19-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
ADP, Inc	Commercial	-	-	-
Essex County Environmental Center	County Building	X	X	Do not have the jurisdiction to mitigate. County-owned.
Roseland Pump Station*	Potable Pump Station	X	X	2020-ROSELAND-012
Well 11 (Roseland)	Potable Well	X	X	2020-ROSELAND-012

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), Flooding within the Borough of Roseland occurs as a consequence of heavy rains usually resulting from localized thunderstorms and hurricanes during the summer and fall months. Due to the low permeability of certain soils, the high degree of development and less than adequate storm sewers in the borough, some areas are subject to frequent flooding and ponding of surface water. A damaging storm occurred on August 2, 1973, creating considerable overbank flooding along Passaic River, Foulerton's Brook, North Branch Foulerton's Brook, and Canoe Brook. This flood on Passaic River had an estimated return period of 83 years. Flooding associated with this storm caused traffic interruptions, property damage, siltation of streambeds, and erosion of embankments. Hurricane Irene on August 29-30, 2011, caused flooding on Passaic River and was estimated to have a 16-year return period (FEMA FIS 2014).

Problem flooding locations in Roseland identified at various times include area along Foulerton's Brook at Locust, Second, Third, and Fourth Avenues, all of which have experienced flooding during severe rainstorms. There are other areas along North Branch Foulerton's Brook at Gates, Mitchell, and Godfrey Avenues, Plymouth Place, Freeman Street, and Condit Court where overbank erosion occurred during the August 1973 storm (FEMA FIS 2014).

Roseland Borough experiences flooding that affect commercial, residential and Borough-owned properties. Properties previously damaged during flood and wind events have been identified in the East, Central, and West ends of the Borough. Undersized culverts and the inability for floodwaters to pass through the areas contribute to flood issues. Properties located along the South Branch of the Foulerton Brook in the West End have experienced repetitive flood losses.

Other areas of flooding in the Borough include:



- The east end of the Borough has experienced repeated flooding in localized areas affecting both residential and borough-owned properties. These areas are identified flood areas (Zone X and AE) by the NFIP FIRM maps. Several losses re-occurred to multiple dwellings in this area related to major storms and associated flooding.
- The central area of the Borough has also experienced repeated flooding of several residential properties along the Zone X and Zone AE class areas as indicated by the NFIP FIRM maps. Several losses reported in this area as both flooding and wind damage due to storm events on a re-occurring basis.
- The west end of the Borough has repeated flooding occurring along particular sections of the brook corridor, identified as the South Branch of Foulerton Brook, and depicted within the Zone AE and Zone X on the NFIP maps. Several homes in this lower elevation of the Borough and positioned along the Brook have experienced reoccurring flooding from major storm events over the past years. Certain homes have reoccurring flooding due to an undersized channel that causes flooding of neighboring properties.
- Undersized culvert on Birch Drive in the Borough and flooding is promoted during heavy storm events. This area has been subject to repeat flooding of certain properties during various storm events due to this undersized culvert.
- Flooding along Woodland Road and Steel Court affects businesses in the Borough and various residential properties in the neighboring town of West Caldwell. This is predominately due to a run of undersized pipe.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Roseland 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 Roseland has significant exposure; refer to Figure 9.19-1 and 9.19-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 Roseland. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Borough of Roseland has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community, as reported in Table 9.19-14. During the review of the draft calculated hazard ranking, the Borough indicated the following:



- The Borough changed the hazard ranking for flood from low to high given the severity of the flooding that is experienced by the Borough.
- The Borough changed the hazard ranking for cyber-attack from low to medium due to increasing threats of cyber-attack experienced by municipalities, schools, and private industry.
- The Borough changed the hazard ranking for economic collapse from medium to low due to the current economy.
- The Borough changed the hazard ranking for hazardous substances from low to medium due to the presence of the Williams/Transco Roseland Compressor Station natural gas releases and potential spills on roads and highways.

Table 9.19-14. Borough of Roseland Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Medium	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Low	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Medium	High	Low	Low

9.19.7 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 9.19-15. 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 #
Roseland-1 Obtain backup power to ensure continuity of operations of transportation/infrastructure. The	Borough OEM	In progress	Yes	2020-ROSELAND-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 #
following has been identified at this time: Roseland traffic signal generators.				
Roseland-2 Roseland critical facilities fuel storage tanks upgrade.	Borough OEM	Discontinue. FEMA will not support.	No	-
Roseland-3 Eagle Rock Avenue Bridge Replacement Project over Passaic River.	Borough	Complete	No	-
Roseland-4 Address the severe flooding conditions in the area of Woodland Road and Steel Court which effects both Roseland and West Caldwell properties; installation of a second pipe for a distance of 150 feet	Borough OEM	In progress	Yes	2020-ROSELAND-002
Roseland-5 Second Avenue Flooding Relief Project.	Borough	Discontinue. DEP will not support	No	-
Roseland-6 Regional stream corridor study through the lower elevations of the South Branch of Foulteron Brook encompassing three county-owned culverts at road crossings.	Borough OEM	No progress	Yes	2020-ROSELAND-003
Roseland-7 Obtain backup power to ensure continuity of operations at critical facilities. The following have been identified at this time: Emergency back-up power for the OEM building (140 Eagle Rock Avenue).	Borough OEM	No progress	Yes	2020-ROSELAND-004
Roseland-8 The Borough will consider hazard mitigation projects identified in this HMP when constructing upcoming operating and capital improvement budgets.	Borough	No progress	Yes	2020-ROSELAND-005

In addition to the above progress, the Borough of Roseland identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Borough of Roseland received a Hazard Mitigation Grant in July 2014 for \$15,500 to upgrade 4 major intersections in the Borough of Roseland. The money was used to upgrade the traffic signals to battery backup and, if necessary, generator capable to operate the traffic signal. Included in the upgrade was equipment for the control box, a generator for each intersection, and equipment to secure the generator to the control box. After completion of the project, the OEM office has continued the project for one intersection per year to ultimately accomplish all intersection using funds left over at the end of each year. At present, 6 intersections have been completed and 6 require upgrades estimated at \$6,000 per intersection.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Roseland participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough





of Roseland participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.19-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Roseland 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.19-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.19-18 summarizes the actions by type across hazards of concern.



Table 9.19-16. 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-ROSELAN D-001	Provide portable generator for traffic signals.	Traffic signals lose power during storms.	Obtain backup power to ensure continuity of operations of transportation/ infrastructure.	Existing	Utility Interruption	1.2, 6.1, 6.2	<u>Borough OEM</u>	HMGP, PDM, Municipal Budget	High	Medium	Short	High	SIP	PR, ES
2020-ROSELAN D-002	Steel Court Flooding Project	Severe flooding conditions in the area of Woodland Road and Steel Court which effects both Roseland and West Caldwell properties	Address flooding near Woodland Road and Steel Court. Install second pipe for a distance of 150 feet to address flooding.	Existing	Flood, Severe Storm, Severe Winter Storm	1.2	<u>Borough Engineering</u>	HMGP, PDM, Municipal Budget	High	High	Medium	High	SIP	PR, PP, SP
2020-ROSELAN D-003	Study regional stream corridor of South Branch of Foulteron Brook.	Lower elevations of the South Branch of Foulteron Brook are subject to flooding.	Regional stream corridor study through the lower elevations of the South Branch of Foulteron Brook encompassing three county-owned culverts at road crossings.	Existing	Flood, Severe Storm, Severe Winter Storm	1.2, 6.1	<u>Borough Engineering</u>	Municipal Budget	High	Medium	Medium	High	SIP	PR, PP, SP
2020-ROSELAN D-004	Provide permanent backup generator for OEM building.	The OEM building (140 Eagle Rock Avenue) loses power during storms.	Obtain backup power to ensure continuity of operations at	Existing	Utility Interruption	1.2, 6.1, 6.2	<u>Borough OEM</u>	HMGP, PDM, Municipal Budget	High	Medium	Short	High	SIP	PR, 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
			critical facilities.											
2020-ROSELAN D-005	Investigate adding line item to budget for Hazard Mitigation.	Operating and capital improvement budgets do not have a line item specific to hazard mitigation.	The Borough will consider hazard mitigation projects identified in this HMP when constructing upcoming operating and capital improvement budgets.	Existing	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Severe Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure	1.3, 4.2	<u>Borough Administration</u>	Municipal Budget	Medium	Low	Short	Medium	LPR	PR
2020-ROSELAN D-006	Update FPA Ordinance for duties of Borough Engineer.	Chapter 22-9.2 of the Local Code identifies the Construction Code Official as the floodplain manager. Responsibilities of the	Borough will update FDPO to designate the engineer, who is also a CFM, as the FPA.	New	Flood	1.3, 4.2	<u>Borough Administration, Borough Engineering</u>	Municipal Budget	Medium	Low	Short	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
		floodplain administrator include permit reviews for new development.												
2020-ROSELAN D-007	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP	Include discussion of Essex County HMP in next update.	New	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Severe Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure	4.1, 5.4	<u>Planning Board</u>	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, PI
2020-ROSELAN D-008	Sustainable Jersey Participation	The Borough does not currently participate in Sustainable Jersey.	It is recommended that the Borough evaluate certification under the	New	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood,	3.1, 4.2	<u>Borough Administration,</u>	Municipal Budget	Medium	Low	Long	Medium	LPR	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
			program. (http://www.sustainablejersey.com/).		Geological hazards, Severe Weather, Severe Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure									
2020-ROSELAN D-009	Remove school from 2017 EOP evacuation staging area	The Borough lists the following staging areas for evacuation in 2017 EOP: Noecker School, First Aid Squad Building, Borough Hall Complex.	The First Aid Squad has backup power, but the school does not. School should be removed as primary evacuation staging site from EOP.	New	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Severe Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease	1.3, 4.3	<u>Borough OEM</u>	Municipal Budget	Medium	Low	Short	Medium	LPR	PR, 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	CIRS Category
					Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure									
2020-ROSELAN D-010	Mitigate flood-prone properties, including RL properties in the Canoe Brook floodplain	Frequent flooding events resulted in damages to the Canoe Brook floodplain properties. This area is residential, and these properties are repeatedly flooded.	Conduct outreach to flood prone property owners, including RL/SRL property owners and provide information about 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	New	Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	Borough Engineering	HMGP, PDM grants, local costs to homeowners	High	Medium	Medium	High	SIP	PR, PP, 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
			residential homes that experience flooding.											
2020-ROSELAN D-011	Birch Dr. / Thackery Dr. Drainage Project	Storm drain and culverts have limited capacity causing flooding of homes in local areas.	Add capacity and create discharge bypass to direct the additional stormwater downstream past the culverts that are limiting flow due to lack of capacity.	New	Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	<u>Borough Engineering</u>	HMGP, PDM, Municipal Budget	High	Medium	Long	Medium	SIP	PR, PP, SP
2020-ROSELAN D-012	Determine pump plan	Roseland Pump Station (Potable pump station) and Well 11 (Potable Well) are located in the floodplain.	Borough will investigate options for securing the two critical pumps.	New	Flood, Severe Storm	1.2, 2.1, 6.1	<u>Borough Engineering</u>	Municipal Budget	Medium	High	Medium	Medium	SIP	PR, PP
2020-ROSELAN D-013	Essex County Environmental Center	Essex County Environmental Center is in the floodplain.	Borough will reach out to the county to discuss mitigation strategies and BMPs for facilities in the floodplain.	New	Flood, Severe Storm, Severe Winter Storm	1.2, 2.2	<u>Borough Engineering</u>	Municipal Budget	Medium	Low	Medium	Medium	EAP	PR

Notes:

Acronyms and Abbreviations:

CAV Community Assistance Visit
 CRS Community Rating System
 DPW Department of Public Works

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:





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

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 9.19-17. 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-ROSELAND-001	Provide portable generator for traffic signals.	1	1	1	1	0	1	1	0	0	1	0	1	1	1	10	High
2020-ROSELAND-002	Steel Court Flooding Project	1	1	1	1	1	0	1	0	1	0	1	1	1	1	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-ROSELAND-003	Study regional stream corridor of South Branch of Foulteron Brook.	1	1	1	1	0	1	0	1	1	1	1	0	0	1	10	High
2020-ROSELAND-004	Provide permanent backup generator for OEM building.	1	1	1	1	0	1	1	0	0	1	1	1	1	1	11	High
2020-ROSELAND-005	Investigate adding line item to budget for Hazard Mitigation.	1	1	1	1	0	1	1	0	0	0	1	0	0	0	7	Medium
2020-ROSELAND-006	Update FPA Ordinance for duties of Borough Engineer.	1	1	1	1	0	1	1	0	0	0	1	0	1	0	8	Medium
2020-ROSELAND-007	Master Plan and HMP Integration	1	1	1	1	0	1	1	0	0	0	1	0	0	0	7	Medium
2020-ROSELAND-008	Sustainable Jersey Participation	1	1	1	1	0	1	1	0	0	0	1	0	0	1	8	Medium
2020-ROSELAND-009	Remove school from 2017 EOP evacuation staging area	0	1	1	1	0	1	1	0	0	0	1	0	0	0	6	Medium
2020-ROSELAND-010	Mitigate flood-prone properties, including RL properties in the Canoe Brook floodplain	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-ROSELAND-011	Birch Dr. / Thackery Dr. Drainage Project	1	1	0	1	0	0	1	1	1	0	1	0	1	0	8	Medium
2020-ROSELAND-012	Determine pump plan	1	1	1	1	0	1	1	0	0	0	1	0	0	1	8	Medium
2020-ROSELAND-013	Essex County Environmental Center	0	1	1	0	0	1	1	1	1	0	1	0	0	0	7	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.19-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion / Sea Level Rise	-	-	2020-ROSELAND-007, 008	-	-	-	-	-
Coastal Storm	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	x	-	-
Drought	2020-ROSELAND D-007	-	2020-ROSELAND-007, 008	-	-	-	-	-
Earthquake	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Extreme Temperature	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Flood	2020-ROSELAND D-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-001, 002,003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND D-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013
Geological hazards	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Severe Weather	-	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-001, 004	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND D-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013
Severe Winter Weather	-	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-001, 004	2020-ROSELAND -002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND D-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013	2020-ROSELAND-002,003, 005, 006, 007, 008, 009, 010, 011, 012, 013
Wildfire	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Civil Disorder	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Cyber Attack	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Disease Outbreak	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Economic Collapse (new)	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Hazardous Substances	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Utility Interruption	-	2020-ROSELAND-004	2020-ROSELAND-007, 008	2020-ROSELAND-004	2020-ROSELAND-001, 004	2020-ROSELAND-004	2020-ROSELAND D-004	2020-ROSELAND-004



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Terrorism	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	-	-	-
Transportation Failure	-	-	2020-ROSELAND-007, 008	-	2020-ROSELAND-001, 004	x	-	-

Note: Section 6 (Mitigation Strategy) provides an explanation of the mitigation categories.

9.19.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Roseland 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.19-19. Contributors to the Annex

Entity	Title	Method of Participation
Gary Schall	Superintendent DPW	Primary POC
John Matheis	OEM Coordinator	Attended the mitigation strategy workshop and contributed to the mitigation strategy

Figure 9.19-1. Borough of Roseland Hazard Area Extent and Location Map

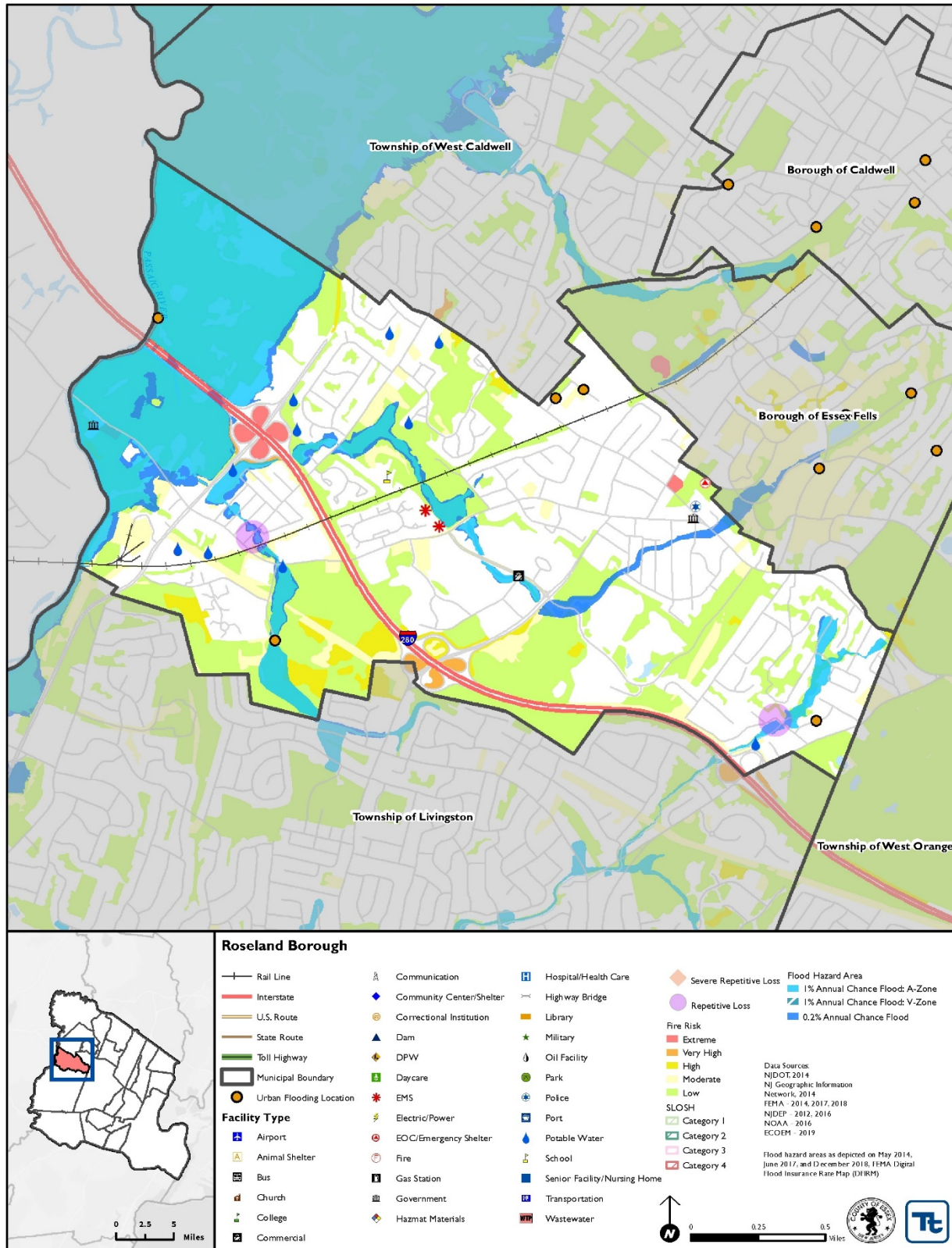
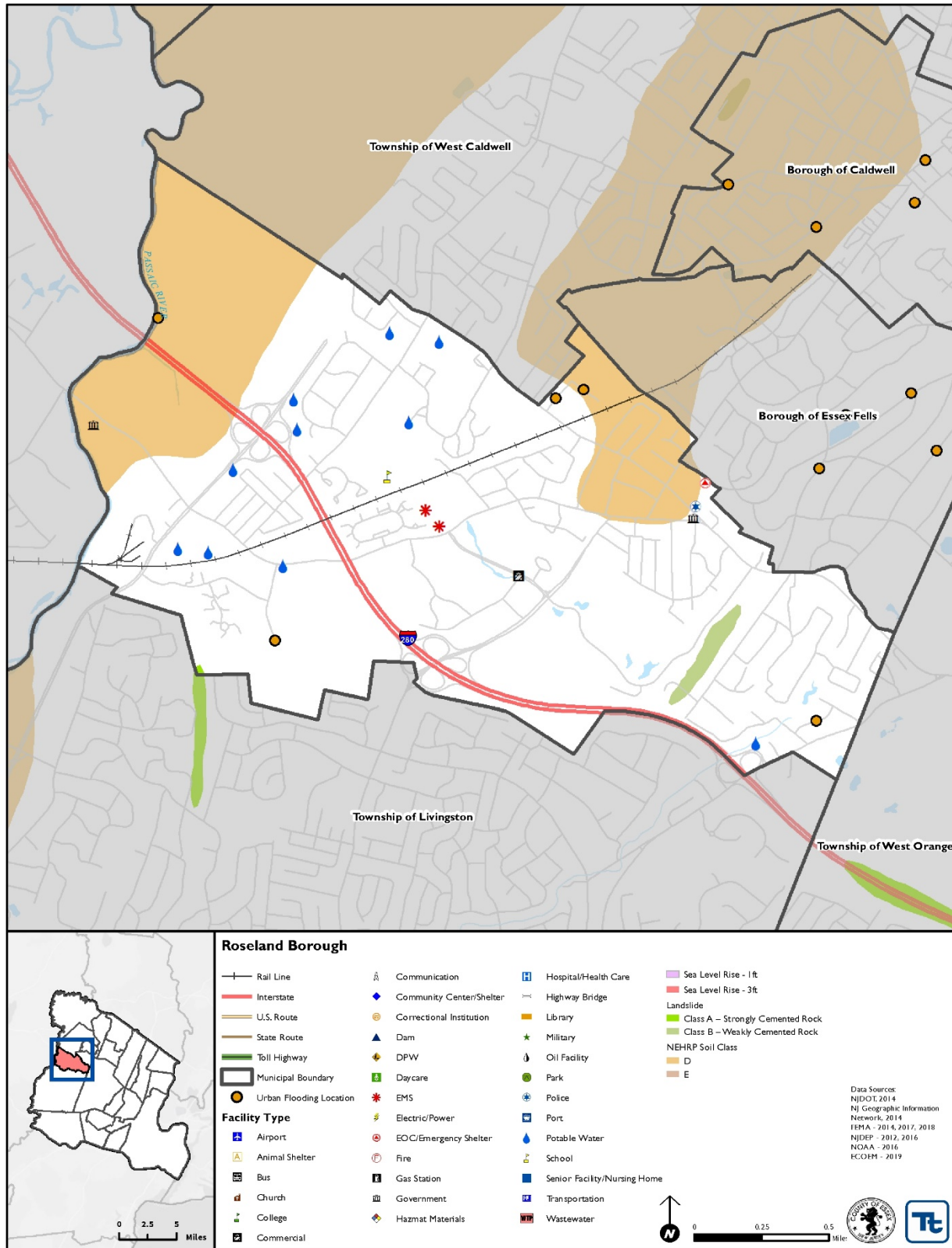




Figure 9.19-2. Borough of Roseland Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet			
Project Name:	Steel Court Flooding Project		
Project Number:	2020-ROSELAND-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Flooding with property damage to both residential and commercial properties and affects both Roseland and West Caldwell properties. The volume of flow and debris result in a blocked single pipe.		
Action or Project Intended for Implementation			
Description of the Solution:	Install a larger trash rack in advance of the inlet pipe at the headwork to intercept debris that blocks the pipe.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year storm	Estimated Benefits (losses avoided):	9 residential and 3 major business structures
Useful Life:	40 years	Goals Met:	
Estimated Cost:	\$30,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	HMGP, PDM grants, capital budget
Responsible Organization:	DPW, Engineering	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Buy Impacted properties	Too expensive	Too expensive
	Build 2 nd 150' outlet pipe	\$1M	Trash rack is more cost effective
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet		
Project Name:	Steel Court Flooding Project	
Project Number:	2020-ROSELAND-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	Effects residents in neighboring towns.
Legal	0	
Fiscal	1	Capital budget request
Environmental	0	
Social	1	Joint community issue.
Administrative	0	
Multi-Hazard	1	Effects different towns.
Timeline	1	Within 2 years of awarded funding.
Agency Champion	1	DPW, OEM
Other Community Objectives	1	Eliminate or minimize flooding to Steel Court.
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet			
Project Name:	Provide permanent backup generator for OEM building.		
Project Number:	2020-ROSELAND-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The OEM building (140 Eagle Rock Avenue) loses power during storms.		
Action or Project Intended for Implementation			
Description of the Solution:	Obtain backup power to ensure continuity of operations at critical facilities.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	100-year storm	Estimated Benefits (losses avoided):	No loss of power
Useful Life:	30 years	Goals Met:	1.2, 6.1, 6.2
Estimated Cost:	\$85,000-\$95,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	1-2 years
Estimated Time Required for Project Implementation:	2 years	Potential Funding Sources:	HMGP, PDM grants, capital budget
Responsible Organization:	OEM, DPW	Local Planning Mechanisms to be Used in Implementation if any:	n/a
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Install Solar	Too expensive	Too expensive
	Obtain generator	High	More cost effective than solar
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet		
Project Name:	Provide permanent backup generator for OEM building.	
Project Number:	2020-ROSELAND-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	OEM office is lead agency for all disasters and must be operational in all circumstances.
Property Protection	1	OEM will remain operational.
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	Generator can be installed at the site.
Fiscal	1	Costly
Environmental	0	
Social	0	Joint community issue.
Administrative	1	Will need to work with engineering.
Multi-Hazard	0	
Timeline	1	Less than 5 years.
Agency Champion	1	DPW, OEM
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet			
Project Name:	Canoe Brook Flooding		
Project Number:	2020-ROSELAND-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, severe storm		
Description of the Problem:	Frequent flooding events resulted in damages to the Canoe Brook flood plain properties. This area is residential, and these properties have been repeatedly flooded, as documented by the NFIP claims.		
Action or Project Intended for Implementation			
Description of the Solution:	Mitigate flood-prone properties, including RL/SRL properties. Conduct outreach to flood prone property owners, including RL/SRL property owners and provide information about 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 flooding.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year storm	Estimated Benefits (losses avoided):	Eliminate flood damage to structures
Useful Life:	30 years	Goals Met:	
Estimated Cost:	\$3 M	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	6-12 months
Estimated Time Required for Project Implementation:	3 years	Potential Funding Sources:	HMGP, PDM grants, local costs to homeowners
Responsible Organization:	<u>NFIP FPA</u> , 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 area floods, entire area is impacted, and elevating homes is part of problem.
	Elevate roads	\$500,000	Elevated roads would not protect the structures form flood damages.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet		
Project Name:	Canoe Brook Flooding	
Project Number:	2020-ROSELAND-010	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Residents are moved from flood-prone areas.
Property Protection	1	Properties are moved from flood-prone areas.
Cost-Effectiveness	1	Cost effective better than reactionary.
Technical	1	Technically-feasible project.
Political	1	
Legal	1	Town has legal authority for project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Residents might move from town.
Administrative	0	
Multi-Hazard	1	Flood, severe storm
Timeline	0	
Agency Champion	1	NFIP FPA, supported by residents
Other Community Objectives	1	Eliminate or minimize flooding to Steel Court.
Total	10	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet			
Project Name:	Birch Dr. / Thackery Dr. Drainage Project		
Project Number:	2020-ROSELAND-011		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, severe storm		
Description of the Problem:	Storm drain and culverts have limited capacity causing flooding of homes in local areas.		
Action or Project Intended for Implementation			
Description of the Solution:	Add capacity and create discharge bypass to direct the additional stormwater downstream past the culverts that are limiting flow due to lack of capacity		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year storm	Estimated Benefits (losses avoided):	Eliminate flood damage to structures
Useful Life:	50 years	Goals Met:	1.2, 2.2
Estimated Cost:	\$480,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, PDM grants
Responsible Organization:	<u>NFIP FPA</u> , Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Master plan committed review.
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate homes	\$500,000	When area floods, entire area is impacted, and elevating homes is part of problem.
	Elevate roads	\$500,000	Elevated roads would not protect the structures form flood damages.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of Roseland
 Name and Title Completing Worksheet: Gary Schall, Superintendent DPW

Action Worksheet		
Project Name:	Birch Dr. / Thackery Dr. Drainage Project	
Project Number:	2020-ROSELAND-011	
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	1	
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	0	
Timeline	0	
Agency Champion	1	DPW/OEM
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



TOWNSHIP OF SOUTH ORANGE VILLAGE

MUNICIPALITY AT A GLANCE

Total Population: **16,503**

Total Land Area: **2.8 sq mi**

Total # Buildings: **4,188**



1% Annual Chance Flood



32

Population Residing
in Floodplain



8

Persons That
May Seek Shelter

100-Year MRP Event Wind Loss



\$1.7 Million

Potential Building Damages



\$7.9 Million

Potential
Building Damages



1

Critical Facilities
in Floodplain

NFIP Statistics



61 # NFIP
Policies

4 # SRL NFIP
Properties

0 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and Non-
Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resource
Protection, Emergency Services,
Structural Projects, Climate Resilience,
Community Capacity Building

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9.20 TOWNSHIP OF SOUTH ORANGE VILLAGE

This section presents the jurisdictional annex for the Township of South Orange Village. The annex includes a general overview of the Township; an assessment of the Township of South Orange Village’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 hazards.

9.20.1 Hazard Mitigation Planning Team

The following individuals are the Township of South Orange Village’s identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.20-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Adam D. Loehner / Village Administrator Address: 76 South Orange Avenue, South Orange, NJ 07079 Phone Number: 973-378-7715 x 2 Email: aloehner@southorange.org	Name / Title: Salvatore Renda / Village Engineer Address: 76 South Orange Avenue, South Orange, NJ 07079 Phone Number: 973-378-7715 x 3990 Email: srenda@southorange.org
NFIP Floodplain Administrator	
Name / Title: Salvatore Renda / Village Engineer Address: 76 South Orange Avenue, South Orange, NJ 07079 Phone Number: 973-378-7715 x 3990 Email: srenda@southorange.org	

9.20.2 Jurisdiction Profile

According to the U.S. Census Bureau, the Township has a total land area of 2.857 square miles, of which 2.855 square miles is land and 0.002 square miles is water. The Township of South Orange Village is in the middle of Essex County and is bordered to the north by the Township of West Orange and the Cities of Orange and East Orange, to the east by the City of Newark, and to the south and west by the Township of Maplewood.

The land of the Township of South Orange Village was originally part of property acquired by Robert Treat in 1666 from the Lenape Tribe. As the population grew, the rail lines on New Jersey transit expanded to South Orange allowed commuters to get directly to Penn Station in New York City 30 minutes. Seton Hall University is in the Township of South Orange Village (The Township of South Orange Village 2014). The Township of South Orange Village operates using a Board of Trustees with six members and a Village President (The Township of South Orange Village 2014).

According to the U.S. Census, the 2010 population for the Township of South Orange Village was 16,198. The estimated 2017 population was 47,609, a 1.9 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 11.7 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.



9.20.3 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 9.20-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.20-1 and 9.20-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.20-2. 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		1			1
Multi-Family			2	2	
Other (commercial, mixed-use, etc.)			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					
320 Valley Street	Mixed Use	22 units	320 Valley Street	None	Construction almost complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
HUB Realty LLC	Mixed Use	110 units	South Orange Ave / Vose Road / Taylor Road	None	In redevelopment negotiations
270 Irvington Avenue	Mixed Use	48 unit	270 Irvington Ave	None	In redevelopment negotiations
299 Irvington Avenue	Mixed Use	12 units	299 Irvington Ave	None	In redevelopment negotiations
4 th and Valley	Mixed Use	50 units	4 th and Valley	None	In redevelopment negotiations
164 Valley Street	Mixed Use	35 units	164 Valley St	None	In redevelopment negotiations
Cruz Holder	Mixed Use	3 Units	184 Valley St	None	In construction
The Learning Experience Academy of Early Education	Commercial	1 Unit	109 and 115 South Orange Ave	None	In construction
The Y Group	Residential	8 Units	14 Second Street	None	In construction
Cruz Holding	Residential	4 Units	11-13 Church St	None	In construction

* Only location-specific hazard zones or vulnerabilities identified.

9.20.4 Capability Assessment

The Township of South Orange Village 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 South Orange Village.

Table 9.20-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Township of South Orange Village	Planning Board	Yes on County Roads	Yes	No	No
<i>Comment: South Orange Village Municipal Code Chapter 185 Land Development. Adopted 1-12-1981 by Ord. No. 80-39 (Ch. 92, Part 1, of the 1982 Code).</i>							
Zoning Code	Yes	Township of South Orange Village	Zoning Board of Adjustments	Yes on County Roads	No	No	No
<i>Comment: South Orange Village Municipal Code Chapter 185 Land Development, Part 13 Zoning. Adopted 2-22-1982 by Ord. No 81-34 (Ch 92, Part 13, of the 1982 Code).</i>							
Subdivisions	Yes	Township of South Orange Village	Planning Board	No	No	No	No
<i>Comment: South Orange Village Municipal Code Chapter 185 Land Development, Part 5 Subdivision. Adopted 9-21-1981 by Ord. No. 81-21 (Ch. 92, Part 5, of the 1982 Code).</i>							
Stormwater Management	Yes	Township of South Orange Village	Village Engineer	NJDEP	Yes	No	No
<i>Comment: South Orange Village Municipal Code Chapter 303 Stormwater Management. No specific citation.</i>							
Post-Disaster Recovery	No	-	-	-	No	-	-
<i>Comment:</i>							
Real Estate Disclosure	No	-	-	-	No	-	-
<i>Comment:</i>							
Growth Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Site Plan Review	Yes	Township of South Orange Village	Village Planner, Planning Board	No	No	No	No
<i>Comment: South Orange Village Municipal Code Chapter 185 Land Development, Part 4 Site Plan Review. Adopted 9-21-1981 by Ord. No. 81-29 (Ch. 92, Part 4, of the 1982 Code).</i>							



Section 9.20 - Township of South Orange Village

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Environmental Protection	No				No		
<i>Comment:</i>							
Flood Damage Prevention	Yes	Township of South Orange Village	Village Engineer	FEMA	Yes	Yes	No
<i>Comment: South Orange Village Municipal Code Chapter 160 Flood Damage Prevention. Unclear what is adoption date. Authorized by N.J.S.A. 40:48-1 et seq.</i>							
Emergency Management	No	-	-	-	-	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	-	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	-	-	-
<i>Comment:</i>							
Disaster Reconstruction Ordinance	No	-	-	-	-	-	-
<i>Comment:</i>							
Other: Historic Preservation Ordinance	Yes	Township of South Orange Village	Historic Preservation Commission	SHPO	No	No	No
<i>Comment: 9-17 Creation, Pursuant to N.J.S.A. 40:55D-65i and 40:55D-107 et seq., there is created an Historic Preservation Commission ("Commission") in the Township of South Orange Village (the "Village") to advise the Planning Board and Zoning Board of Adjustment on applications as provided for herein and to make written reports to the administrative officer on applications for certificates of appropriateness.</i>							
Planning Documents							
Comprehensive / Master Plan	Yes	Township of South Orange Village	Village Planner	No	Yes	No	Yes
<i>Comment: South Orange Master Plan. Adopted November 2006. Currently in update. See Mitigation Action 2020-S ORANGE-005.</i>							
Capital Improvement Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Disaster Debris Management Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Floodplain or Watershed Plan	Yes	Township of South Orange Village	Engineering/DPW	No	No	No	No
<i>Comment: Stream Corridor Management Plan. Adopted February 2007.</i>							
Stormwater Management Plan	Yes	Township of South Orange Village	Engineering	NJDEP	Yes	No	No
<i>Comment: Stormwater Management Plan April 2018. https://southorange.org/DocumentCenter/View/1385/Municipal-Storm-Water-Management-Plan</i>							



Section 9.20 - Township of South Orange Village

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Township of South Orange Village	Engineering	NJDEP	Yes	No	No
<i>Comment: Stormwater Pollution Prevention Plan April 2018 https://southorange.org/DocumentCenter/View/1386/Storm-Water-Pollution-Prevention-Plan</i>							
Urban Water Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Habitat Conservation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Economic Development Plan	Yes	Township of South Orange Village	Village Planner	No	No	No	No
<i>Comment: Vision Plan. Adopted October 2007.</i>							
Shoreline Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Community Wildfire Protection Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Community Forestry Management Plan	Yes	Township of South Orange Village	Administration, DPW Shade Tree Department	No	No	No	No
<i>Comment: Community Forestry Management Plan 2016-2020. Adopted December 2015.</i>							
Transportation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Agriculture Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Business Development Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Other: Open Space Plan	Yes	Township of South Orange Village	Village Planner	No	No	No	No
<i>Comment: Recreation and Open Space Element of the Land Use Master Plan. Adopted December 2004.</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Other: Redevelopment Plan	Yes	Township of South Orange Village	Village Planner	No	No	No	No
<i>Comment: Redevelopment Plan. Adopted November 2009.</i>							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of South Orange Village	Administration, Public Safety	County, State	Yes	No	No
<i>Comment: Not available for review.</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	No	-	-
<i>Comment:</i>							
Post-Disaster Recovery Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Continuity of Operations Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Public Health Plan	Yes	Township of South Orange Village	Health Department	No	No	No	No
<i>Comment: Annex to CEMP.</i>							
Other	No	-	-	-	No	-	-
<i>Comment:</i>							

Table 9.20-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Engineering, Zoning, Building
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 Mostly existing properties are redeveloped.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of South Orange Village.



Table 9.20-5. 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	Planning and Economic Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	CivicReady
Maintenance program to reduce risk	Yes	Pre storm Mitigation DPW clearing
Mutual aid agreements	Yes	County Fire, Police
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering & Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering & Building
Planners or engineers with an understanding of natural hazards	Yes	Engineering
Staff with training in benefit/cost analysis	No	-
Surveyors	No	-
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Personnel skilled or trained in GIS applications	Yes	Engineering
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Administration/Public Safety
Watershed Planner	No	-
Environmental Specialist	Yes	South Orange Environmental Commission
Grant writers	Yes	Administration
Resilience Officer	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of South Orange Village.

Table 9.20-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes, Administration
Capital Improvements Project Funding	Yes, Administration, Board of Trustees
Authority to Levy Taxes for Specific Purposes	Yes, Board of Trustees
User Fees for Water, Sewer, Gas or Electric Service	Yes, Water (through NJAW)/Sewer/Tax Collector/PSE&G
Incur Debt through General Obligation Bonds	Yes, Administration, Board of Trustees
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No



Financial Resource	Accessible or Eligible to Use?
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of South Orange Village.

Table 9.20-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	No
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	No
<ul style="list-style-type: none"> If yes, briefly describe. 	-
Do you use social media for hazard mitigation education and outreach?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Facebook, Twitter, Instagram
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes
<ul style="list-style-type: none"> If yes, briefly describe. 	Transportation Committee, Economic Development and Planning Committee

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of South Orange Village.

Table 9.20-8. 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	August 2014
Storm Ready Certification	No	-	-
Firewise Community Classification	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.



The municipality has access to resources to determine the possible impacts of climate change upon the municipality. The administration is supportive of integrating climate change in policies or actions. Climate change and sustainability are already being integrated into current policies/plans or actions (projects/monitoring) within the municipality sustainability and are incorporated into all municipal decisions.

Table 9.20-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Low
Drought	Medium
Earthquake	Low
Extreme Temperatures	Medium
Flood	Medium
Geological Hazards	Low
Severe Storm	High
Winter Storm	High
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Low
Utility Interruption	High
Terrorism	High
Transportation Failure	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 9.20-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (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?	Unknown



Criterion	Response
Does your floodplain management program meet or exceed minimum requirements?	Meets
<ul style="list-style-type: none"> If exceeds, in what ways? 	n/a
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAV: 7/9/12 GTA: 5/6/13
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
<ul style="list-style-type: none"> If so, state what they are. 	-
Are any RiskMAP projects currently underway in your jurisdiction?	No
<ul style="list-style-type: none"> If so, state what they are. 	-
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
<ul style="list-style-type: none"> If no, state why. 	-
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
<ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	Flood Plain Administrator
Does your jurisdiction participate in the Community Rating System (CRS)?	No
<ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? 	-
<ul style="list-style-type: none"> If no, is your jurisdiction interested in joining the CRS program? 	No
How many flood insurance policies are in force in your jurisdiction?	61
What is the insurance in force?	\$18,784,600
What is the premium in force?	\$29,873
How many total loss claims have been filed in your jurisdiction?	38
How many claims are still open or were closed without payment?	0
What were the total payments for losses?	\$150,472
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

* 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

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of South Orange Village made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- The Village requires backflow preventers that are inspected whenever work is being done on a property.
- Coordination with PSEG for tree trimming program.
- The Village has established shelters as the South Orange Performing Arts Center, the South Orange Public Library, and the Baird Community Center that is undergoing major renovation to become a shelter.



- The Township of South Orange Village participates in the Sustainable Jersey program and achieved Bronze certification. Actions for certification on October 21, 2019 with 255 points were provided in the certification report at http://www.sustainablejersey.com/certification/participating-communities/certification-report/?tx_sjcert_certification%5Bcertification%5D%5B__identity%5D=751&tx_sjcert_certification%5Baction%5D=show&tx_sjcert_certification%5Bcontroller%5D=Certification&cHash=a1ffe1b1f1e2357065aa5f620bffde5.

9.20.5 Hazard Event History Specific to the Jurisdiction

Essex 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 Essex County and its jurisdictions. The Township of South Orange Village's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.20-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.



Table 9.20-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR 4264)	Yes	Low pressure moving across the deep South on January 21 and January 22 intensified and moved off the Mid Atlantic coast on January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.	The Township reported that it sustained losses during this storm but did not have an estimate available.
July 1, 2016	Thunderstorm Wind	No	A passing cold front triggered a few severe thunderstorms over northeast New Jersey. Power lines were reported down in South Orange. \$0.75K in property damages were reported.	No losses.
March 14, 2017	Winter Storm	No	Rapidly deepening low pressure tracked up the eastern seaboard on March 14, bringing 8 to 13 inches of heavy snow and sleet, along with strong winds across Northeast New Jersey.	No losses.
January 4, 2017	Winter Storm	No	The low pressure rapidly intensified through January 4, as it moved north-northeast along the coast. The rapid intensification of the storm led to heavy snow, strong winds, and near-blizzard conditions across northeast New Jersey, with 8.4 inches of snow and winds gusts of 44 MPH reported at Newark Liberty Airport.	No losses.
March 7, 2018	Winter Storm	No	A strong low-pressure system tracked along the coast through late March 7 and early morning on March 8 bringing heavy wet snow, strong gusty winds, and thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times, resulting in 1 to 2 feet, which brought down trees and some power lines.	Total losses for trees, sidewalks, debris removal, equipment, labor, and administration (Categories A, B, E, F) for \$760,873.67
November 15, 2018	Winter Storm	No	A wave of low pressure developed along the Middle	No losses.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			Atlantic coast November 15. The heavy, wet snow significantly impacted the evening rush hour with 1-2 inch per hour snowfall rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, causing many power outages. Newark Airport reported 6.4 inches of snow.	
January 30, 2019	Strong Wind	No	Strong winds occurred behind low pressure and cold front, with 30 mph sustained winds measured at Caldwell Airport.	No losses.
March 15, 2019	Strong Wind	No	A cold front moved through the region triggering strong to severe thunderstorms across northeast New Jersey.	No losses.

9.20.6 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 9.20-12 summarizes the risk assessment results used to inform the Township of South Orange Village calculated hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of South Orange Village.

- Number of repetitive loss (RL) properties: 4
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Note: RL and SRL as of 03/31/2019.



Table 9.20-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,739,095	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$11,519,412	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	0	NEHRP D&E:	0	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$1,796,487	
						2,500-year Loss:	\$30,830,217	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,930	Physical 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.		Low
		Population Below Poverty Level:	1,985					
Flood	100- and 500-Year Mean Return Period Event	100-year	32	100-year	6	100-year Loss:	\$7,869,838	High
		500-year	32	500-year	6			
Geological	High Landslide Susceptibility Areas	Class A:	18	Class A:	6	Class A:	\$15,365,495	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	33	Wildfire:	11	Wildfire:	\$18,056,328	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	<p>Port Newark is in Essex County (3rd largest port in the U.S.)</p> <p>Major highways/rail</p> <p>Pipelines</p> <p>10 NPL Sites in County</p>	<p>Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.</p>	<p>The degree of damages to a building depends on the scale of the incident.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Utility Interruption	<p>Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.</p>	<p>The degree of impact to the population depends on the scale of the incident.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Terrorism	<p>Terrorist Attack</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Transportation Failure	<p>One accident on any of the following: Roadway/vehicular, Aviation, Rail</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>Low</p>



CRITICAL FACILITIES

The table below identifies critical facilities in the community located in the 1-percent and 0.2-percent floodplains and the status of mitigation at each location. If a new mitigation action is identified, the mitigation action ID is listed; refer to Table 9.18-16 for additional details regarding the project.

Table 9.20-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
South Orange Public Works	Public Works Department	X	X	2020-S ORANGE - 001

ADDITIONAL IDENTIFIED VULNERABILITIES

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), due to the topography of the East Branch Rahway River, and the Township of South Orange Village’s proximity to the headwaters of the river, flood peaks occur rapidly. The flood cycle usually lasts a matter of hours, and, in most cases, lasts less than a day. Local drainage area flooding in Township of South Orange Village follows the same pattern. The major flood damage has occurred in the business community, where the flood waters have entered first-floor levels of retail and service type establishments and businesses; in addition, flood damage has occurred to the basements of residences. Because the Village is highly congested, even minor flooding causes damage to both public and private property and create traffic hazards (FEMA FIS 2014).

The Rahway River and its tributaries are located in the North Atlantic Storm Belt and flooding of the East Branch Rahway River in South Orange occurs frequently. Overflow of the East Branch Rahway River causes a flood problem in the Township of South Orange Village, between the northern and southern boundaries of the village, for residential, commercial, industrial, and public facilities. The principal cause of the flooding is the inability of the existing channel to accommodate the precipitation runoff. This is partly due to bridge constrictions and low channel capacities caused by encroaching development (FEMA FIS 2014).

The Township of South Orange Village has sustained damages from floods; the historic floods occurred during July 1901, February 1902, October 1903, August 1927, July 1938, August 1955, May 1968, September 1971, and August 1973. The damaging storms on record occurred in South Orange during the floods of July 1938. The historic flooding occurred during the storm of October 1903; however, because of the absence of development in the community, damages were not as great as those that occurred during the August 1973 flood (FEMA FIS 2014).

Additionally, the municipality has identified the following hazard problems and/or problem areas:

- Ludington Brook poses localized flooding threats to neighboring properties. There are currently discussions with West Orange, Essex County, and South Orange to address the issues. Three houses at the bottom of Ludington Brook continue to flood.
- The Department of Public Works garage, office, and entire property continuously flood as a result of the property being in the floodplain.
- The Newstead area is prone to flooding and one house repetitively sustains damage.



HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of South Orange Village 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 South Orange Village has significant exposure; refer to Figures 9.20-1 and 9.20-2.

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 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Township of South Orange Village. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of South Orange Village has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community, as reflected in Table 9.20-14.

During the review of the hazard ranking, the Township of South Orange Village indicated the following:

- The Township of South Orange Village changed the hazard ranking for flood from low to high due to the amount of flooding that occurs in the Township.
- The Township of South Orange Village changed the hazard ranking for wildfire from low to medium due to the presence of the South Mountain Reservation.
- The Township of South Orange Village changed the hazard ranking for civil disorder from low to medium.
- The Township of South Orange Village changed the hazard ranking for cyber attack from low to medium.
- The Township of South Orange Village changed the hazard ranking for disease outbreak from low to medium.
- The Township of South Orange Village changed the hazard ranking for terrorism from low to high.
- The Township of South Orange Village changed the hazard ranking for transportation failure from low to medium.

Table 9.20-14. Township of South Orange Village Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium



Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Medium	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Medium	Medium	Low	High	High	Medium

9.20.7 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 9.20-15. 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 #
Township of South Orange Village-1 Obtain back up power to ensure continuity of operations. The following have been identified at this time: Local infrastructure- Generators at 2 sites: South Orange Village Hall & South Orange Rescue Squad Buildings	Township Manager	Complete. Both buildings are no longer used for emergency services.	-	-
Township of South Orange Village-2 Retrofit/elevation DPW building which is located in a floodplain.	Township Engineering	No progress	Yes	2020-S ORANGE -001
Township of South Orange Village-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.	Township Supervisor's Office	In progress.	Yes	2020-S ORANGE -002
Township of South Orange Village-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	Township Engineering, FPA	In progress.	Yes	2020-S ORANGE -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 #
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 from FEMA and local match availability.				
Township of South Orange Village-5 Develop and implement a post-event damage assessment program, including the following elements: • Conduct public outreach/ education (see Public Education and Awareness Initiatives above) to inform property owners of the need to report property damage and obtain required permitting when making repairs. • Develop and organize local resources to conduct post-event damage assessments, including substantial damage determinations as warranted. • Develop an inventory (file system and/or database) of losses (incl. loss of service, property damage, economic losses, etc.) as reported to and/or identified by the Village (e.g. building permit process).	Township Engineering, FPA	No progress.	-	Village evaluated and determined not a priority.
Township of South Orange Village-6 Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.	Township FPA	No progress.	-	Village evaluated and determined not a priority.
Township of South Orange Village-7 Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).	Township FPA	No progress.	-	Village evaluated and determined not a priority.
Township of South Orange Village-8 Enhance/expand the Village's tree maintenance program and coordination with utilities (PSEG).	Township Engineering	In progress.	Yes	2020-S ORANGE -004
Township of South Orange Village-9 Create/ Enhance/ Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Township	In progress.	Existing Integration	Continue with local mutual aid agreements with public safety authorities.



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 #
Township of South Orange Village-10 Township will use the HMP as a guide when updating their Master Plan	Township Planner (Consultant)	In progress.	Yes	2020-S ORANGE -005

In addition to the above progress, the Township of South Orange Village identified the following mitigation projects/activities that were completed but not identified in the 2015 HMP mitigation strategy:

- The Village identified mitigation activities using a berm at Allen Court and Whiteoak Drive since the previous plan.
- The Village installed a rain park in Cameron Park to mitigate flooding from areas that were not previously well-draining.
- Waterlands Park was forested by 300 trees to build up the property next to the East Branch of the Rahway River.
- Luddington Brook has been cleared of debris and siltation to mitigate flooding at the bottom of the brook.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of South Orange Village participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of South Orange Village participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.20-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of South Orange Village 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High, Medium, or Low*.

Table 9.20-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.20-18 summarizes the actions by type across hazards of concern..



Table 9.20-16. 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-S ORANGE - 001	Retrofit/elevate DPW building	DPW building is in the 100-year floodplain and is subject to flooding during severe storms.	Feasibility study for flood hazard mitigation of the building	Existing	Flood	1.2, 2.1, 6.1, 6.2	Village Engineering	HMGP, PDM	High	High	Long	High	SIP	PP, ES
2020-S ORANGE- 002	Public outreach, education, mitigation information program	Develop and implement an enhanced all-hazards, public program on natural hazard risks and what they can do in the way of mitigation and preparedness, including flood insurance.	Provided information to residents from NFIP program. Will develop a website with links to information.	Existing	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure	3.1, 3.3	Village Engineering	Municipal budget	High	Low	Short	High	EAP	PI
2020-S ORANGE- 003	Mitigate of vulnerable structures	Mitigate vulnerable structures via retrofit (e.g.	Phase 1: Identify appropriate candidates	Existing	Flood	1.2, 2.2	Village Engineering, FPA	Municipal budget	High	Low	Long	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
		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.	and determine most cost-effective mitigation option (in progress). Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability.											
2020-S ORANGE-004	Enhance/expand the Village's tree maintenance program and coordination with utilities (PSEG).	The Village is working with PSE&G to document maintenance and inventory trees.	Phase I working with PSEG is complete. Phase II for tree inventory and database upload .	Existing	Utility Interruption	1.2, 6.1	<u>Village Administration</u>	Municipal budget	High	Medium	Short	High	NSP	PR
2020-S ORANGE-005	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP	Include discussion of Essex County HMP in next update.	Existing	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Winter Weather, Wildfire, Civil	4.1, 5.4	<u>Village Planner</u>	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, 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
					Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure									
2020-S ORANGE-006	Baird Center Basement Flooding	The Baird Center is used as a shelter, but the basement floods during storms.	Building renovation to include basement floodproofing.	New	Flood	1.2.2.1, 6.1	<u>Village Administrator</u>	HMGP, PDM	High	High	Medium	High	SIP	PP
2020-S ORANGE-007	Culvert Failure	The culvert at 101 South Orange Avenue West in the center of town is failing.	The township will investigate options for remediating the culvert.	New	Flood	1.2, 2.2	<u>Village Engineer</u>	HMGP, PDM, Village budget	High	High	Long	High	SIP	PP

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 9.20-17. 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-S ORANGE-001	Retrofit/elevate DPW building	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-S ORANGE-002	Public outreach, education, mitigation information program	1	1	1	1	1	1	1	0	1	1	1	1	0	1	12	High
2020-S ORANGE-003	Mitigate of vulnerable structures	1	1	0	1	0	0	0	1	1	1	0	1	0	1	8	Medium
2020-S ORANGE-004	Enhance/expand the Village's tree maintenance program and coordination with utilities (PSEG).	1	1	1	1	0	1	1	0	0	1	1	1	0	1	10	High
2020-S ORANGE-005	Master Plan and HMP Integration	1	1	1	1	0	0	0	0	1	1	1	1	0	0	8	Medium
2020-S ORANGE-006	Baird Center Basement Flooding	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	High
2020-S ORANGE-007	Culvert Failure	0	1	1	1	0	1	0	0	1	1	1	1	1	0	9	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.20-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	2020-S ORANGE - 001, 003, 006, 007	-
Coastal Storm	-	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007
Drought	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Earthquake	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Extreme Temperature	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	2020-S ORANGE - 001, 004	2020-S ORANGE - 001
Flood	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007	2020-S ORANGE - 001, 002, 003, 004, 005, 006, 007
Geological hazards	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 002, 005	-	-	-
Severe Weather	-	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006
Severe Winter Weather	-	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006	2020-S ORANGE - 001, 002, 003, 004, 005, 006
Wildfire	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	2020-S ORANGE - 001	-
Civil Disorder	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Cyber Attack	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Disease Outbreak	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Economic Collapse	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Hazardous Substances	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-
Utility Interruption	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004	2020-S ORANGE - 004
Terrorism	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-



Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Transportation Failure	-	-	2020-S ORANGE - 002, 005	-	2020-S ORANGE - 001, 002	-	-	-

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.20.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of South Orange Village 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 9.20-19. Contributors to the Annex

Entity	Title	Method of Participation
Adam D. Loehner	Village Administrator	Primary POC, Meeting 1, Meeting 2
Salvatore Renda	Village Engineer	Alternate POC, FPA, Mitigation Action Workshop



Figure 9.20-1. Township of South Orange Village Hazard Area Extent and Location Map

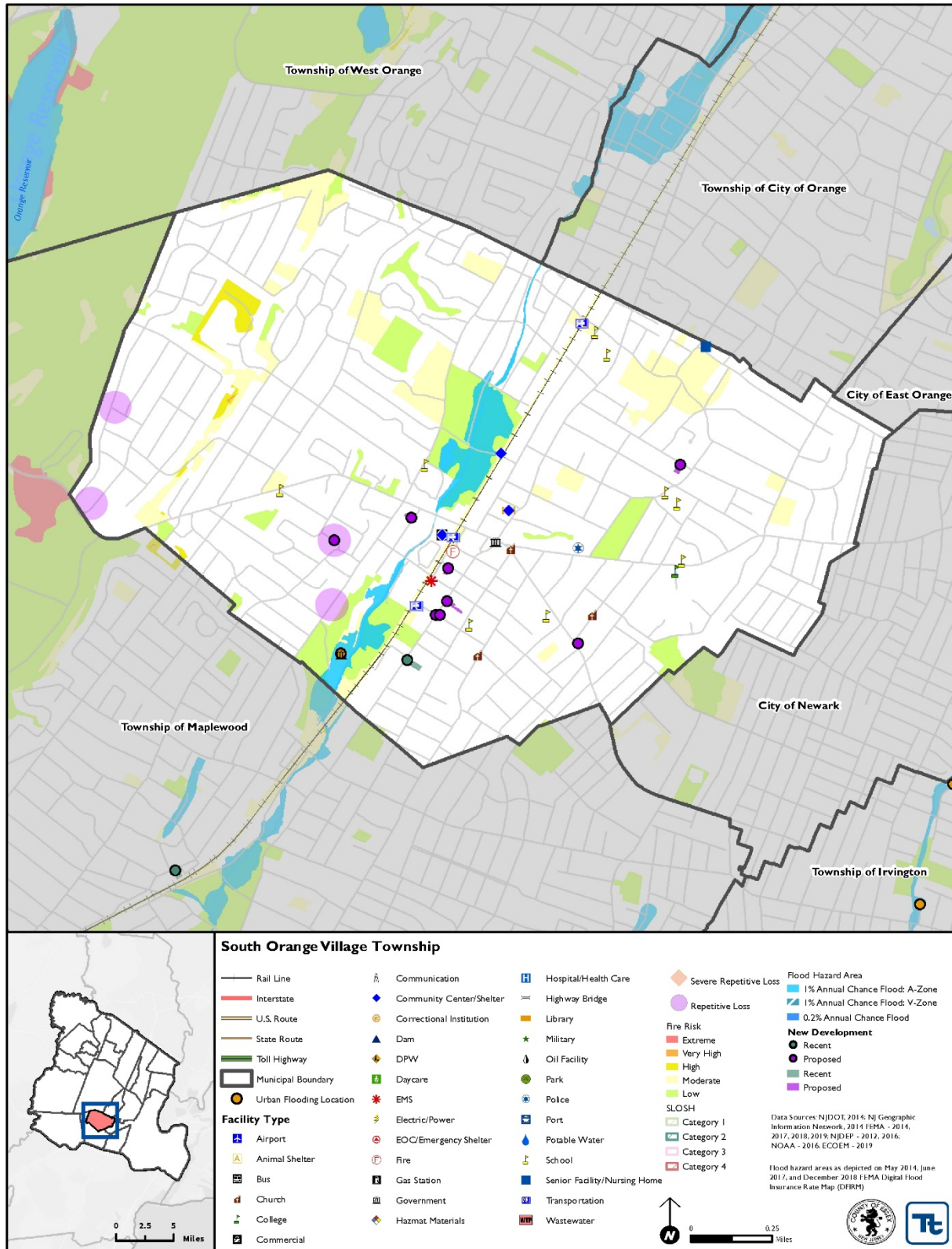
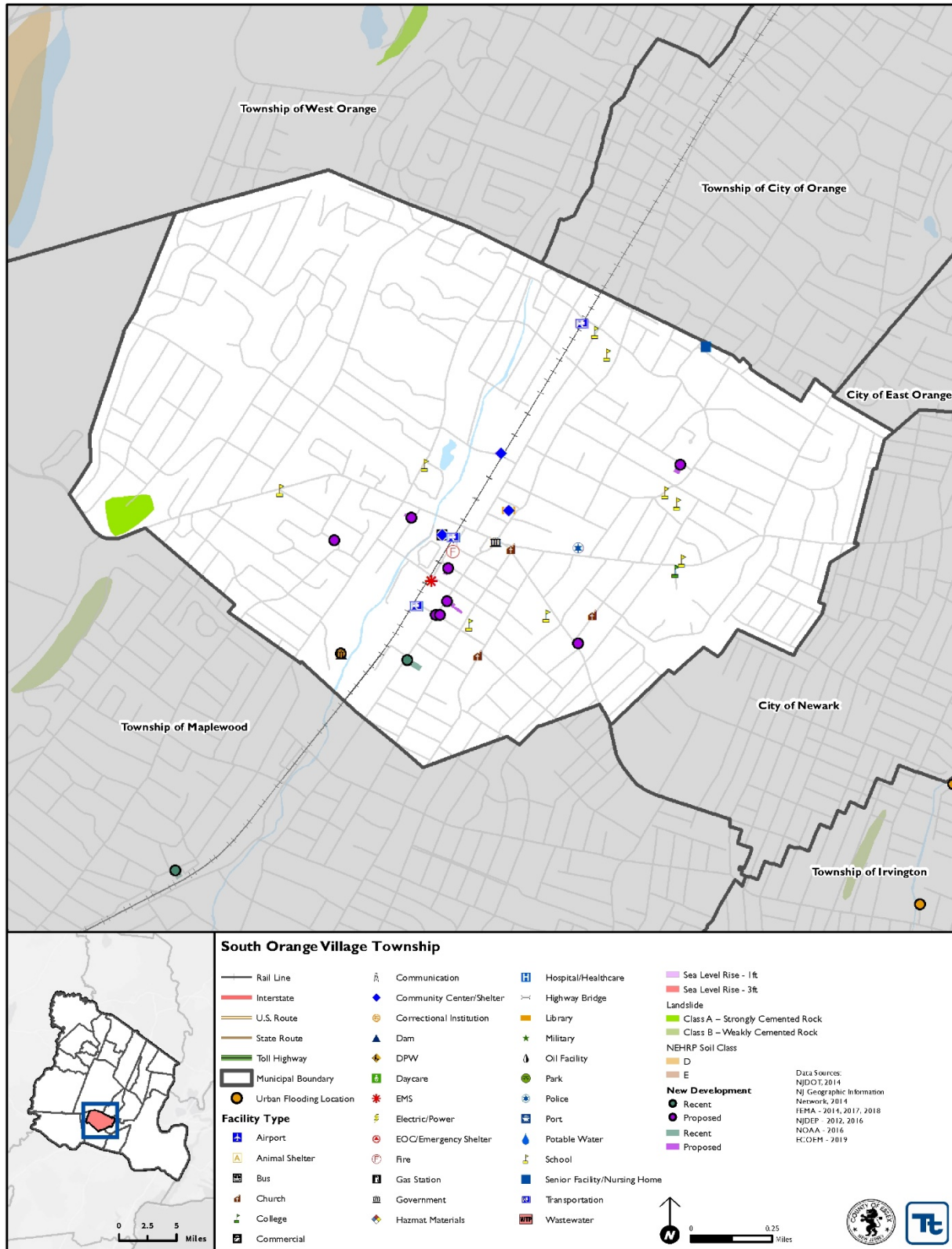




Figure 9.20-2. Township of South Orange Village Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet			
Project Name:	Retrofit/elevate DPW building		
Project Number:	2020-S ORANGE -001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Emergency Services for coastal storm, severe storm, or severe winter storm.		
Description of the Problem:	DPW building is in the 100-year floodplain and is subject to flooding during severe storms.		
Action or Project Intended for Implementation			
Description of the Solution:	Feasibility study for flood hazard mitigation of the building.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	DPW no loss of essential function
Useful Life:	TBD	Goals Met:	1.2, 2.1, 6.1, 6.2
Estimated Cost:	Estimate of greater than \$1M due to ADA accessibility requirements.	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	2 year for assessment	Potential Funding Sources:	HMGP, PDM
Responsible Organization:	Village 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
	Relocate Facility	Not feasible	No place to move
	Floodproof DPW	High	Feasibility study
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet		
Project Name:	Retrofit/elevate DPW building	
Project Number:	2020-S ORANGE -001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protect employees, equipment and other assets, and residents.
Property Protection	1	
Cost-Effectiveness	1	Prevent future damages.
Technical	1	
Political	1	
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	Help residents who visit facility or who need services.
Administrative	1	
Multi-Hazard	1	Prevent the building from flood damage and others from lack of services.
Timeline	1	
Agency Champion	1	Village Administrator, Village Engineer
Other Community Objectives	1	
Total	14	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet			
Project Name:	Baird Center Basement Flooding		
Project Number:	2020-S ORANGE -006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Emergency Services for coastal storm, severe storm, or severe winter storm.		
Description of the Problem:	Baird Center is near the 100-year floodplain. The Baird Center is used as a shelter, but the basement floods during storms.		
Action or Project Intended for Implementation			
Description of the Solution:	Building renovation to include basement floodproofing.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	100 year flood	Estimated Benefits (losses avoided):	Baird Center Shelter no loss of essential function
Useful Life:	50 years	Goals Met:	1.2, 2.2
Estimated Cost:	TBD	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	2 year for assessment	Potential Funding Sources:	HMGP, PDM
Responsible Organization:	Village 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
	Relocate Facility	Not feasible	No place to move
	Floodproof Baird Center	High	Feasibility study
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:	Project is in design.		
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet		
Project Name:	Baird Center Basement Flooding	
Project Number:	2020-S ORANGE -006	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Used for shelter when required
Property Protection	1	Protect building utilities
Cost-Effectiveness	1	Prevent future damage
Technical	1	
Political	1	
Legal	1	
Fiscal	1	
Environmental	0	
Social	1	Will help support local residents
Administrative	1	To be maintained by staff
Multi-Hazard	1	Prevent flooding, used in storms as shelter
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet			
Project Name:	Culvert Failure		
Project Number:	2020-S ORANGE -007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Emergency Services for coastal storm, severe storm, or severe winter storm.		
Description of the Problem:	The culvert at 101 South Orange Avenue West in the center of town is failing and has collapsed. The culvert was constructed in the early 1800s and a section needs to be replaced.		
Action or Project Intended for Implementation			
Description of the Solution:	Excavate damaged pipe. Form reinforced concrete, restore culvert.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year floodplain with stormwater capacity	Estimated Benefits (losses avoided):	No flood or subsidence in center of town
Useful Life:	30 years	Goals Met:	1.2, 2.2
Estimated Cost:	\$50,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	2 year for assessment	Potential Funding Sources:	HMGP, PDM
Responsible Organization:	Village Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Municipal budget
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Relocate Facility	Not feasible	No place to move
	Floodproof DPW	High	Feasibility study
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: Township of South Orange Village
 Name and Title Completing Worksheet: Salvatore Renda, Village Engineer

Action Worksheet		
Project Name:	Culvert Failure	
Project Number:	2020-S ORANGE -007	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Adjacent buildings are affected.
Cost-Effectiveness	1	Prevent future damages.
Technical	1	
Political	0	
Legal	1	Township property
Fiscal	0	
Environmental	0	
Social	1	Neighboring properties are affected.
Administrative	1	
Multi-Hazard	1	
Timeline	1	Must be completed soon.
Agency Champion	1	Village Administrator, Village Engineer
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	



TOWNSHIP OF VERONA

MUNICIPALITY AT A GLANCE

Total Population: **13,585**
 Total Land Area: **2.8 sq mi**
 Total # Buildings: **4,113**



1% Annual Chance Flood



110

Population Residing
in Floodplain



2

Persons That
May Seek Shelter



\$2.2 Million

Potential
Building Damages



2

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$1.2 Million

Potential Building Damages

NFIP Statistics



65 # NFIP
Policies

2 # SRL NFIP
Properties

1 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

Flood, Severe Weather,
Utility Interruption

Project Types

Prevention, Property Protection, Public
Education/Awareness, Structural
Projects

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9.21 TOWNSHIP OF VERONA

This section presents the jurisdictional annex for the Township of Verona. The annex includes a general overview of the Township of Verona; an assessment of the Township of Verona’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 hazards.

9.21.1 Hazard Mitigation Planning Team

The following individuals are the Township of Verona’s identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.21-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Joel Martin, Detective/OEM Coordinator Address: 600 Bloomfield Ave, Verona, NJ 07044 Phone Number: 973-857-4819 Email: Joel.Martin@veronapolice.org	Name / Title: Chris Kiernan, Police Chief Address: 600 Bloomfield Avenue, Verona, NJ 07044 Phone Number: 973-857-4818 Email: Chris.Kiernan@veronapolice.org
NFIP Floodplain Administrator	
Name / Title: Michael DeCarlo Address: 10 Commerce Court, Verona, NJ 07044 Phone Number: 973-857-8146 Email: mdecarlo@veronanj.org	

9.21.2 Jurisdiction Profile

In 1702, settlers left Newark and bought land from the Lenni Lenape Native Americans to form what would eventually become the Borough of Verona in 1892. It was not until 1982 that Verona became a Township. Township of Verona is registered as a Sustainable Jersey community which means they are committed to going green, saving money, and sustaining their quality of life (Verona Township of Verona, New Jersey, 2014). Verona Township is located east of Caldwell, west of Montclair, north of the Eagle Rock Reservation, and south of Cedar Grove. The Township of Verona has five Council Members who are elected at-large. The Mayor and Deputy Mayor are selected to serve two year terms (Verona Township of Verona, New Jersey, 2014).

According to the U.S. Census, the 2010 population for the Township of Verona was 13,332. The estimated 2017 population was 13,585, a 1.9 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 6.2 percent of the population is 5 years of age or younger and 19.9 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.

9.21.3 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 9.21-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.21-1 and Figure 9.21-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development, where available.



Table 9.21-2. 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	3	2	3	6	1
Multi-Family	6	3	0	2	0
Other (commercial, mixed-use, etc.)	1	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					
Verona Place East and West Apartment	Multi-Family – Apartments	20 / 2	435 & 449 Bloomfield Avenue		Completed & Inhabited
Annin Loft & Luxury Apartments	Multi-Family – Apartments	111 / 2	151 Bloomfield Ave		Permits Open, Paperwork Pending, Units Renting
163 Bloomfield Ave	Mixed-Use	Unknown	163 Bloomfield Ave B:9 L:15	None	Completed and Occupied
200 Bloomfield Ave	Mixed-Use	Unknown	200-210 Bloomfield Avenue B:8 L:1	Wildfire: Low	Cancelled by Planning/Zoning Board
623-625 Bloomfield Ave	Commercial	Unknown	623-625 Bloomfield Ave B: 92 L:14	NEHRP: D	Building demolished. Currently open space.
860 Bloomfield Ave	Commercial	Unknown	860 Bloomfield Ave B: 81 L:1	None	Currently in planning spaces, included as part of affordable housing litigation
US Home Corporation d/b/a Lennar	Residential	33 Units	Durrell St B: 72 L:1	NEHRP: D	Completed and Occupied
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

* Only location-specific hazard zones or vulnerabilities identified.

9.21.4 Capability Assessment

The Township of Verona 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 Verona.



Table 9.21-3. Planning, Legal and Regulatory Capability

Codes, Ordinances, & Requirements					
Building Code	Yes	Local and State	Yes	-	-
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14</i>					
Zoning Code	Yes	Local and State	Yes	-	-
<i>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.</i>					
Subdivisions	Yes	Local and State	Yes	-	-
<i>Comment: 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 18 (4/27/76) of the Township code. Planning Board and Governing Body enforces the Subdivision Code.</i>					
Stormwater Management	Yes	Local	Yes	-	-
<i>Comment: Township of Verona Stormwater Management Ordinance, Chapter 123, adopted 11-21-2005, amended in its entirety 10-15-2012. The Township is currently re-writing their Stormwater Management Ordinance and their Stormwater Management Plan to be completed by the end of 2020 as part of the Township's Master Plan update. More stringent development requirements will be put into place, which exceed the NJDEP Standards for Major Development. The new requirement will be any project with 400 Square Feet of impervious surface or 0.25 acres of land disturbance and will require homeowners to institute structural or non-structural mitigation projects to reduce stormwater runoff. The Township will also perform education and outreach as part of the MS4 Permit for Stormwater Mitigation and Green Infrastructure Implementation. State Requirements for Stormwater Management Plans are noted in Title 7 of the NJ Administrative Code, N.J.A.C. 7:8.</i>					
Post-Disaster Recovery	No	-	No	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	-	-
<i>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.</i>					
Growth Management	No	-	Yes	-	-
<i>Comment: State Mandated on a municipal level. See Zoning Ordinance ; Also - 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.</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	-	-
<i>Comment: Township of Verona, Chapter 118, effective 05-21-1979. §118-13 states "The Planning Board may require additional information within site plans which is not limited to geologic information, water yields, flood data, environmental information, traffic counts, road capacities, market information, economic data for the proposed business or activity, hours of operation and similar information." General Site Plan Requirements are noted in §118-3 of the ordinance.</i>					
Environmental Protection	No	-	Yes	-	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	-	-
<i>Comment: Township of Verona, Flood Control Ordinance, effective 05-07-2007 as amended. The code requires a development permit if construction will be in the floodplain. All new construction and substantial improvements must be constructed with materials and utility equipment resistant to flood damage and must be constructed using methods and practices that minimize flood damage.</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	No	-	-	-	-
<i>Comment:</i>					



Codes, Ordinances, & Requirements					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other: Steep Slopes Ordinance, Tree Ordinance	Yes	Local	No	-	-
<p><i>Comment:</i> Township of Verona, Chapter 150, Article XXI, Effective 04-04-2016. §150-21.3 states "Except as otherwise specifically set forth, this ordinance shall apply to new development, redevelopment or land disturbance on a steep slope on all properties within the Township of Verona. The Planning Board or Zoning Board of Adjustment shall review all plans submitted under this ordinance as part of any application for a construction permit, site plan approval, or subdivision approval. The Township Engineer, in all cases, shall review all applications for compliance with this ordinance. Applicability of the ordinance may be contested by demonstration to the satisfaction of the Township Engineer that no area on the subject property (or proposed or future subdivision thereof) meets the criteria for the presence of a 15 percent or greater slope. Once demonstrated, the subject property, or subdivision thereof, shall be considered to be exempt from the requirements set forth herein. Township of Verona Tree Ordinance, Chapter 136, effective 10-20-1964. The Township is updating/passing a new tree ordinance which will require a Township permit before removal of trees on private property to reduce localized runoff.</p>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	-	-
<p><i>Comment:</i> Township of Verona Master Plan, 2009. Currently being updated to be completed in 2020. According to NJSA: Yes, if planning board (40:55D-28) and must be re-examined every ten years (40:55D-89.1).</p>					
Capital Improvement Plan	Yes	Local	Allowed	-	-
<p><i>Comment:</i> Capital Improvement Budgeting is performed annually in November as part of Municipal Budget Updates. 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.</p>					
Disaster Debris Management Plan	No	-	No	-	-
<i>Comment:</i>					
Floodplain or Watershed Plan	No	-	No	-	-
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	-	-
<p><i>Comment:</i> The Township is currently re-writing their Stormwater Management Ordinance and their Stormwater Management Plan to be completed by the end of 2020 as part of the Township's Master Plan update. More stringent development requirements will be put into place, which exceed the NJDEP Standards for Major Development. Any project with 400 Square Feet of impervious surface or 0.25 acres of land disturbance and will require homeowners to institute structural or non-structural mitigation projects to reduce stormwater runoff. The Township will also perform education and outreach as part of the MS4 Permit for Stormwater Mitigation and Green Infrastructure Implementation.</p> <p>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).</p>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	-	-
<p><i>Comment:</i> Township of Verona Stormwater Pollution Prevention Plan, Revised April 18, 2012. 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).</p>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	No	-	No	-	-
<i>Comment:</i>					
Shoreline Management Plan	No	-	No	-	-





Codes, Ordinances, & Requirements					
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	-	-
<i>Comment:</i>					
Transportation Plan	Yes	Local	No	-	-
<i>Comment: Circulation Element to Master Plan</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	No	-	No	-	-
<i>Comment:</i>					
Other	No	-	No	-	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>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.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	Local	No	-	-
<i>Comment:</i>					
Continuity of Operations Plan	Yes	Local	No	-	-
<i>Comment: Element to Township of Verona Emergency Operations Plan</i>					
Public Health Plan	No	-	No	-	-
<i>Comment:</i>					
Other	No	-	No	-	-
<i>Comment:</i>					



Table 9.21-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes – Zoning and Building Department
- If no, who does? If yes, which department?	
Does your jurisdiction have the ability to track permits by hazard area?	Zoning Official Tracks
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 Lands are identified

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Verona.

Table 9.21-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board / Zoning Board of Adjustment
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	Economic Development Department
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle Share 911 & Honeywell Messenger (Verona Schools)
Maintenance program to reduce risk	Yes	Department of Public Works
Mutual aid agreements	Yes	Surrounding Communities, Essex County, State of NJ
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Planner (Consultant) Township Engineer (Consultant)
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer (Consultant)
Planners or engineers with an understanding of natural hazards	Yes	Township Planner (Consultant) Township Engineer (Consultant)
Staff with training in benefit/cost analysis	Yes	Finance Department
Surveyors	Yes	Engineering Manager
Personnel skilled or trained in GIS applications	Yes	Engineering Manager
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management
Grant writers	Yes	Engineering Manager, Consulting Grant Writer
Resilience Officer	No	-
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of Verona.



Table 9.21-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes – Included as part of Municipal Budget
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes – Water & Sewer
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
Other	Yes

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of Verona.

Table 9.21-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Each Agency has separate PIO, but the Township Manager would submit communications on behalf of Township
Do you have personnel skilled or trained in website development?	Yes – Township Administration
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.	Yes – Facebook, Twitter, and Instagram are used
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Public Safety Committee which includes a Township Council Liaison, Law Enforcement Liaison, Citizens, and other liaisons as needed.
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes – Nixle, and School Messenger can be used in addition to other social medial platforms and municipal website.
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes, the Township has Lightning Alarms and a Town Horn

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of Verona.

Table 9.21-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	NP	NP
Building Code Effectiveness Grading Schedule (BCEGS)	No	NP	NP
Public Protection (Fire ISO Protection Class)	Yes	3	1/25/2016
Storm Ready Certification	No	NP	NP
Firewise Community Classification	No	NP	NP
Sustainable Jersey	Yes	none	2/27/2014



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.

Table 9.21-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	Low
Drought	Low
Earthquake	Low
Extreme Temperature	Low
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	High
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High
Wildfire	Medium
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Low
Economic Collapse	Medium
Hazardous Substances	Low
Utility Interruption	High
Terrorism	High
Transportation Failure	Low

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 9.21-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building & Code Enforcement
Who is your floodplain administrator? (name, department/position)	Engineering Manager / Zoning Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes



Criterion	Response
What is the date that your flood damage prevention ordinance was last amended?	2010
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAV: 01/14/2009 CAC: 08/16/2018
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	No
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
<input type="checkbox"/> If so, what type of assistance/training is needed?	
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	No Additional information on CRS entry/requirements is preferred.
How many flood insurance policies are in force in your jurisdiction?*	66
<ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	\$17,773,000 \$77,358
How many total loss claims have been filed in your jurisdiction?*	57
<ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	3 Open 21 Closed Without Payment \$406,853.72
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?	A list is maintained of properties within the floodplain

*According to FEMA statistics as of 03/30/2019

9.21.5 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 Verona made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- Department of Administration & Economic Development:** The Department of Economic Development is responsible for the supervision of economic development within the Township of Verona. This includes overseeing and assisting in the retention, attraction, promotion and development of local businesses. The Department seeks to foster positive municipal-business relationships and assist in the establishment and expansion of new businesses. The Department strives to make opening, relocating or running a business in Verona as efficient and lucrative as possible.



- **Department of Building and Code Enforcement:** This department manages Construction Code Enforcement, Property Maintenance Enforcement, Zoning & Zoning Board of Adjustment and Rent Control Board.
 - Construction Code Enforcement: The Construction Code Department oversees the issuance and inspections for all building, electrical, plumbing and fire permits. The department is staffed by a full time Construction Code Official and Building Inspector, along with part-time Building Inspector, Plumbing Inspector, Electrical Inspector, Fire Inspector, and two full time office staff. All inspectors are licensed through the New Jersey Department of Community Affairs.
 - Zoning: The Zoning Department governs residential and commercial zoning along with the Zoning Board of Adjustment. The Zoning Officer determines if proposed construction work to be done or use of buildings follows the township’s zoning ordinance. A variance may be required and must go before the Board of Adjustment for approval if codes are not met. The Zoning Officer provides inspections and enforcement for planning applications. The Zoning Board Secretary and Zoning Officer provide assistance with zoning applications and assist the board.
 - Property Maintenance: The Building Department also responds to property maintenance related matters. The Code Enforcement Official inspects and enforces the codes for maintaining matters such as, landscaping, weed removal, paint, siding, roofs, doors, sidewalks, garbage, refuse, etc.
- **Board of Adjustment:** The Zoning Board of Adjustment reviews applications to utilize property in a manner not consistent with municipal zoning laws. The Board of Adjustment meetings are held the 2nd Thursday of each month at 8:00pm in the Verona Community Center Ballroom, 880 Bloomfield Ave. Verona, NJ 07044.
- **Planning Board:** The Planning Board is charged with addressing permitted land uses. The Board is also responsible for the Township of Verona Master Plan. Planning Board meetings are held on the 4th Thursday of each month at 7:30pm in the Verona Community Center Ballroom, 880 Bloomfield Ave. Verona, NJ 07044.
- **Sustainable Jersey:** Verona is a Sustainable Jersey certified community--one of only 198 in the state. Verona achieved Sustainable Jersey certification at the bronze level. Certified towns are an outstanding group of municipalities that are making important contributions toward the long-term goal of a sustainable New Jersey and world.
- **Environmental Commission:** The role of the Commission is to study, evaluate and make recommendations to the Township Council and the Planning Board regarding local environmental issues, including (but not limited to) preservation and use of parks and other open spaces; clean water resources; stormwater management; air, noise, and light pollution; solid waste management and recycling; energy conservation and renewable energy resources; transportation and circulation planning; and protection of flora, fauna, soil and landscape throughout the Township.
- **Shade Tree Commission:** The Verona Shade Tree Commission is responsible for the care of our public trees, shrubs, and landscapes. The commission is comprised of volunteers who are residents designated by the Mayor and Council. Public Shade Tree Commission meetings are held the 2nd Monday of each month at 5:00 p.m. in the Verona Community Center Conference Room, 880 Bloomfield Avenue, Verona, New Jersey.
 - The Department of Public Works has a tree maintenance and request form available on the municipal website.
- **Verona Historic Preservation Committee (VHPC):** The Verona Historic Preservation Commission is an agency established by the Town Council to assist in the identification and preservation of our town’s landmarks and historical sites.



- **Neighborhood Traffic and Safety Committee:** The Neighborhood Traffic and Safety Committee is hereby charged with the following duties and responsibilities:
 - Work together with residents, elected and appointed officials to study, propose solutions and plan for the implementation of approved traffic calming and pedestrian safety measure.
 - May review and make recommendation to the Zoning Board of Adjustments and the Planning Board on site plans and subdivisions that are submitted to the Boards.
 - May propose, review and make recommendations on ordinances related to public safety.
 - To provide the Council and the Manager periodic reports and recommendations and advise on traffic safety questions/problems and the adequacy of all Township policies and procedures relating to safety.

9.21.6 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3(Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of Verona’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.21-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.21-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	Verona Emergency Services responded to 262 service calls between January 21-24, 2016. Extensive overtime hours were logged by police and public works employees to ensure the safety of residents. Fire department standby crews were required due to downed trees and power lines throughout the township. Trees, brush, and branches were collected by Verona Public Works for approximately 7 days following the storm. Trees uprooted in the storm were removed, and damaged properties were repaired by Verona subcontractors.
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 Peckman River at Verona rose above its flood stage of 3.5 feet at 4:50pm EDT. The river continued to rise above its moderate flood stage of 4.0 feet (4:55pm EDT) and major flood stage of 5.0 feet (5:10pm EDT) before cresting at a height of 6.36 feet at 5:35pm EDT. The river fell back below flood



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			between 2.5 inches and 4 inches of precipitation.	stage at 6:50pm EDT. The crest of 6.36 feet was within about 0.2 feet of the record crest at this location of 6.6 feet.

9.21.7 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 9.21-12 summarizes the risk assessment results used to inform the calculated hazard ranking.



Table 9.21-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA Sea Level Rise: NOAA +1ft and +3ft rise	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
		SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500-MRP Hurricane Wind Category 1 through Category 4 SLOSH	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,223,554	High
		Category 2:	0	Category 2:	0			
		Category 3:	0	Category 3:	0	500-year Wind Loss:	\$7,440,808	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	3,056	NEHRP D&E:	925	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$1,323,391	
						2,500-year Loss:	\$23,452,748	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,697	Physical 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.		Low
		Population Below Poverty Level:	385					
Flood	100- and 500-Year Mean Return Period Event	100-year	110	100-year	33	100-year Loss:	\$2,226,580	High
		500-year	110	500-year	33			
Geological	High Landslide Susceptibility Areas	Class A:	3	Class A:	1	Class A:	\$501,935	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	7	Wildfire:	2	Wildfire:	\$8,372,455	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low
Hazardous Substances	Release at an NPL site: 10 NPL Sites in County	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



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	Vehicular accidents, Aviation Accidents, Railway Accidents	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of Verona.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 1
- Number of RL/SRL properties that have been mitigated: 0

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 floodplains and the status of mitigation at each location. If a new mitigation action is identified, the mitigation action ID is listed; refer to Table 9.18-16 for additional details regarding the project.

Table 9.21-13. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
B&G Garage*	Government	X	X	2020-Verona-007
Verona Park	Government (Park)	X	X	County Park, Verona does not have Jurisdiction

**Identified lifeline*





ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

- Additional outreach is needed on severe storms.
- Peckman River & Tributaries need a flood study.
- Headwalls for Cole Road Drainage Culvert, Eagle Rock Reservation aren't large enough, and flooding occurs after heavy rain events.
- Mt. Prospect & Sunset Ave drainage is poor.
- Verona Park and Bloomfield Avenue drainage is poor.
- Due to build out of Verona, vegetation removal off of private property can lead to runoff flooding between private properties.
- Due to build out of Verona, stormwater and localized flooding is causing significant impacts. Homeowners are renovating and adding additions which is creating runoff flooding.
- Verona's Sanitary Sewer System is aging and is susceptible to breaks and intrusions, specifically at Personette Avenue and Derwent Avenue.
- Verona's stormwater infrastructure is aging and needs to be replaced to enhance capacity.
- Verona's water distribution piping is aging and is subject to breaks and interruption of distribution
- School need generators.
- The Verona Building and Grounds facility is a critical facility and identified lifeline located in the 1% and 0.2% annual chance flood areas.
- There are 3 repetitive loss properties and 1 severe repetitive loss property in the township.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Verona 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 Verona has significant exposure; refer to Figure 9.21-2 and 9.21-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Township of Verona. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of Verona has reviewed the Essex 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 for drought from medium to low.
- The Township changed the hazard ranking for earthquake from medium to low.
- The Township changed the hazard ranking for extreme temperature from medium to low.
- The Township changed the hazard ranking for flood from low to medium.
- The Township changed the hazard ranking for wildfire from low to medium.
- The Township changed the hazard ranking for hazardous substances from low to medium.
- The Township changed the hazard ranking for terrorism from low to medium.

Table 9.21-14. Township of Verona Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Low	Low	Low	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Medium	High	Medium	Low

9.21.8 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 9.21-15. 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 #
Verona -1: Infiltration of storm water into Verona Wastewater Collection Systems – Conduct a study and identify the points of infiltration, causes and solutions to problems. From this	Verona WWTP Engineering	In Progress	X	2020-Verona-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 #
information a plan to mitigate will be developed then implemented.				
<p>Verona -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. At the time of this update the following has been identified specific to the Ozone Avenue bridge. The Ozone Avenue bridge needs to be evaluated due to age. The goal is to open up the waterway under the bridge to mitigate flooding as a result of limited water flow.</p> <p>Phase 1: Evaluate the Ozone Ave Bridge over the Peckman River for proper flow and capacity.</p> <p>Phase 2: Develop action plan based on evaluation of the Ozone Bridge.</p> <p>Phase 3: Re-assess the current FEMA flood plain maps to take into account that the Bloomfield Ave and Linden Ave bridges have been re-configured to include a substantial improvement in the flow of storm water and the Peckman River. This along with a future enhancement of the Ozone Ave Bridge potentially will reduce the flooding of adjacent properties to the Peckman River. The result of these efforts is a potential decrease in required flood insurance to the residential properties in this “flood Zone”</p> <p>Specifically identified are properties in the following areas: Peckman river basin from Verona Park north to Ozone Ave / Cedar Grove</p>	Township Engineering, FPA	No Progress		
<p>Verona-3: Bloomfield at Verona Park flooding/pooling of storm water–</p> <p>Current storm water drainage system is not able to handle the storm water runoff. A solution to increase the storm water drainage underground needs to be developed thus reducing flooding of Bloomfield Ave. The underground storm water system needs to be evaluated for proper flow and capacity.</p> <p>See County action in Section 9.1 Essex-15</p>	Essex County	No Progress – County Stormwater System		



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 #
Verona-4: Claremont Ave, Derwent Ave, and Bloomfield Avenue need to enhance storm water system capacity. This area of town during heavy rain storms is an area in which manhole covers pop off and cause areas of risk. The underground storm water system needs to be evaluated for proper flow and capacity.	Township Engineering	In Progress – Derwent Ave is schedule for maintenance in 2020. Claremont Ave is completed. Bloomfield Ave is County Jurisdiction	X	2020-Verona-002
Verona-5: Emergency back-up generators DPW garage, B&G garage, pump stations Linn Drive and Hillwood Terrace, High School, Community Center and Verona WWTP. See also Verona-8, Verona-9	Township OEM	Complete		
Verona-6: In Verona, Fairview Ave and Crest Hill Road area flood from storm water run-off County Hilltop Park. – Identify and study current storm water system for proper sizing for existing storm water flow. Currently storm water runoff causes flooding in adjacent residential properties on the east side of Fairview Ave down to the old railroad bed. The underground storm water system needs to be evaluated for proper flow and capacity.	Township Engineering	Discontinue – County Jurisdiction		
Verona-7: Verona Township shelter generators to add additional back-up power for cooling and heating centers as well as sheltering. Part of Verona-6	Township OEM	Completed		
Verona-8: Verona Township water pump station has no back-up generator. This pump station is a major component in the Verona water system. Part of Verona-6	Township	Completed		
Verona-9: The Township will use the HMP as a guide during rezoning procedures and when updating their transportation plan to limit access to hazard areas.	Township	Ongoing capability		
Verona-10: Install backup power generators at the following critical facilities in the Township to ensure continuity of operations: <ul style="list-style-type: none"> • DPW garage • B&G garage • Wells Linn Drive and Hillwood Terrace • High School • Community Center • Verona Wastewater Treatment Plant (WWTP) 	Township Engineering	Complete		
Verona-11: Create/Enhance/Maintain Mutual Aid Agreements with neighboring communities for continuity of operations	Township	Ongoing Capability		



The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Verona participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Verona was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 Flood prone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.21-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Verona 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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High, Medium, or Low*.

Table 9.21-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.21-18 summarizes the actions by type across hazards of concern.



Table 9.21-16. 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-Verona-001	Stormwater Infiltration Study	The Verona Wastewater Collection System is being infiltrated by stormwater runoff.	Conduct a study and identify the points of infiltration, causes and solutions to problems. From this information a plan to mitigate will be developed then implemented.	Existing	Flood, Severe Storm	2	Verona Engineering, Township Administration	Federal and State Grant Funding	High	High	Short(DOF)	High	SIP	PP
2020-Verona-002	Stormwater System Upgrade	The stormwater system on Derwent Ave, lack adequate capacity especially during heavy rain events.	The Township will upgrade the stormwater system to increase capacity on Derwent Ave.	Existing	Utility Interruption	2	Verona Engineering	Federal and State Grant Funding, Capital Improvements	High	High	Within 5 Years	High	SIP	PP
2020-Verona-003	Stormwater Ordinance and Stormwater Mitigation Plan Update	Due to build out of Verona, vegetation removal off of private property can lead to runoff flooding between private properties	<p>Re-writing stormwater ordinance and Re-writing stormwater mitigation plan (related to MS4 Tier A Community) – To be completed by NLT 12/31/2020 as part of municipal master plan update</p> <ul style="list-style-type: none"> • Any project with 0.25 acres of new impervious coverage, or 1 acre of land disturbance (Major Development by NJDEP) <ul style="list-style-type: none"> o Instituting higher standard with 400 Sq. Feet of impervious coverage, and 0.25 acres of land disturbance. This will require homeowners to 	N/A	Flood, Severe Storm	3, 5	Verona Engineering, Verona Administration	Municipal Budget	High	High	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
			institute mitigation projects including structural and non-structural projects. <ul style="list-style-type: none"> • Have to do education and outreach as part of MS4 Permit for Stormwater Mitigation/Green Infrastructure Implementation 											
2020-Verona-004	Tree Ordinance	Due to build out of Verona, vegetation removal off of private property can lead to runoff flooding between private properties	Verona is updating/passing a tree ordinance which will require township permit before removal of trees on private property to reduce localized runoff.	N/A	Flood, Severe Storm	5	Verona Engineering, Verona Administration	Municipal Budget	High	Medium	Within 1 year	High	LPR	PR
2020-Verona-005	Sanitary Sewer Upgrades	Verona's Sanitary Sewer System is aging and is susceptible to breaks and intrusions.	<ul style="list-style-type: none"> • Having repairs done, starting in 2 weeks. <ul style="list-style-type: none"> o Personnett Ave, and Derwent Ave • Hitting areas one at a time. • Start 10/2019 to 12/2022 	Existing	Flood, Severe Storm	2	Verona Engineering, Verona Administration	Municipal Budget, Capital Improvements	High	High	Within 3year	High	LPR	PR
2020-Verona-006	Water Distribution Piping Repair	Verona's water distribution piping is aging and is subject to breaks and interruption of distribution	Verona will water distribution piping as time goes on, but will repair in phases: <ul style="list-style-type: none"> o Ann Street, Steven Avenue, Cypress Avenue, Willow Terrace (2020) o Howard Street, Marion Road, Maple Terrace, Hillside Ave, Forest Ave (Identified Area, to 	Existing	Utility Interruption	2	Verona Engineering, Verona Administration	Federal and State Grants, Municipal Budget, Capital Improvements	High	High	Within 3year	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
			<ul style="list-style-type: none"> be addressed 2-3 years) <ul style="list-style-type: none"> o Brentwood Drive, Newman Ave, Floyd Rd, Otsego Road (Identified Area, to be addressed 2-3 years) o Fells Rd, Oak Ridge Rd, Bloomfield Ave, Stocker Rd, Upland Way (Identified Area, to be addressed 2-3 years) 											
2020-Verona-007	Critical Facility Flood Mitigation	The Verona Building and Grounds facility is a critical facility and identified lifeline located in the 1% and 0.2% annual chance flood areas.	The Township will work to mitigate this structure to the 0.2% annual chance flood event or greater.	Existing	Flood, Severe Storm	2	Verona DPW, Verona Engineering, Verona Administration	Federal and State Grants, Municipal Budget, Capital Improvements	High	Medium	Within 3year	High	SIP	PP
2020-Verona-008	RL/SRL Mitigation Outreach	There are 3 repetitive loss properties and 1 severe repetitive loss property in the Township.	The Township will conduct public outreach to the RL properties to identify if there is interest in mitigation (elevation or acquisition). If there is no interest in mitigation, the Township will provide a list of options homeowners can do to protect their home from future flood damage.	Existing	Flood Severe Storm	1,2,3	Verona OEM, Verona Administration	Federal and State Grants, Municipal Budget	High	High	Within 5 Years	High	SIP, EAP	PP, PI
2020-Verona-009	School Generators	Verona schools currently do not have backup power and therefore lack operational	The Township will work to secure grant funding for the installation of generators at the schools.	Existing	Utility Interruption	2, 6	Verona OEM, Verona Administration	Federal and State Grants, Municipal Budget	High	High	Within 5 Years	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
		capabilities during power outage												
2020-Verona-010	Peckman River Flood Study	There Peckman River flows through the Township of Verona and when it floods, it affects many 50-60 homes outside of a FEMA Delineated flood zone.	The Township of Verona will gather information and submit for FEMA Hazard Mitigation Grant Funding for a flood study of the Peckman River and its tributaries that run through the Township. The best identified alternative will be implemented.	Existing	Flood, Severe Storm	1,2,3	Verona Engineering, Verona Administration	FEMA HMA, BRIC, Capital Improvements, USACE, NJDEP	High	TBD	Within 5 years	High	LPR, SIP	PR, PP
2020-Verona-010	Debris Management Plan	The Township lacks a Debris Management Plan.	The Township will develop a Debris Management Plan.	N/A	Flood, Severe Storm, Severe Winter Storm	1, 2, 3, 6	Verona Engineering	Township budget	Medium	TBD	Within 5 years	High	LPR, ES	

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 9.21-17. 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-Verona-001	Stormwater Infiltration Study	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-Verona-002	Stormwater System Upgrade	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-Verona-003	Stormwater Ordinance and Stormwater Mitigation Plan Update	0	1	1	1	0	1	1	1	1	1	1	1	1	0	11	High
2020-Verona-004	Tree Ordinance	0	1	1	1	1	1	1	1	1	1	1	0	0	0	12	High
2020-Verona-005	Sanitary Sewer Upgrades	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-Verona-006	Water Distribution Piping Repair	1	1	1	1	1	1	1	1	0	1	1	1	0	0	11	High
2020-Verona-007	Critical Facility Flood Mitigation	1	1	1	1	0	1	0	1	1	0	0	1	0	1	9	High
2020-Verona-008	RL/SRL Mitigation Outreach	1	1	1	1	1	0	1	1	0	1	1	1	0	0	10	High
2020-Verona-009	School Generators	1	1	1	1	0	1	0	1	1	0	0	0	0	1	8	Medium
2020-Verona-010	Peckman River Flood Study	1	1	1	1	0	0	0	1	1	0	1	1	0	1	9	High
2020-Verona-010	Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	0	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 9.21-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise								
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-Verona-003, 2020-Verona-010, 2020-Verona-004, 2020-Verona-005, 2020-Verona-006	2020-Verona-002, 2020-Verona-007, 2020-Verona-001	2020-Verona-008		2020-Verona-010	2020-Verona-002, 2020-Verona-007, 2020-Verona-001, 2020-Verona-006, 2020-Verona-008		
Geological Hazards (landslides and subsidence/sinkholes)								
Severe Weather (high wind, tornado, TSTM, and hail)	2020-Verona-010, 2020-Verona-001, 2020-Verona-004, 2020-Verona-005, 2020-Verona-006				2020-Verona-010	2020-Verona-001, 2020-Verona-006, 2020-Verona-007		
Severe Winter Weather (heavy snow, blizzards, and ice storms)					2020-Verona-010			
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-Verona-009				2020-Verona-002, 2020-Verona-006, 2020-Verona-009		
Terrorism								
Transportation Failure								



Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.21.9 Staff and Local Stakeholder Involvement in Annex Development

The Township of Verona 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.21-19. Contributors to the Annex

Entity	Title	Method of Participation
Joel Martin	Detective/OEM Coordinator	Primary POC, represented Verona at HMP Meetings. Provided information for New Development, Capability Assessment, Status of Previous Mitigation Actions, and Proposed Mitigation Strategies
Chris Kiernan	Police Chief	Alternate POC
Michael DeCarlo	Floodplain Administrator/Engineering Manager	FPA, attended municipal annex meeting and mitigation strategy meeting. Provided information for Capability Assessment, Status of Previous Mitigation Actions, and Proposed Mitigation Strategies
Matthew Cavallo	Township Manager	Provided input for municipal annex development for the Capability Assessment and Previous Mitigation Actions
Rick Neale	Fire Official	Provided input for municipal annex development for the Capability Assessment and Previous Mitigation Actions
George Zehander	Verona DPW Supervisor	Provided input for municipal annex development for the Capability Assessment and Previous Mitigation Actions
Vincent Colavitti Jr	Fire Inspector	Provided input for municipal annex development for the Capability Assessment and Previous Mitigation Actions



Figure 9.21-1. Township of Verona Hazard Area Extent and Location Map

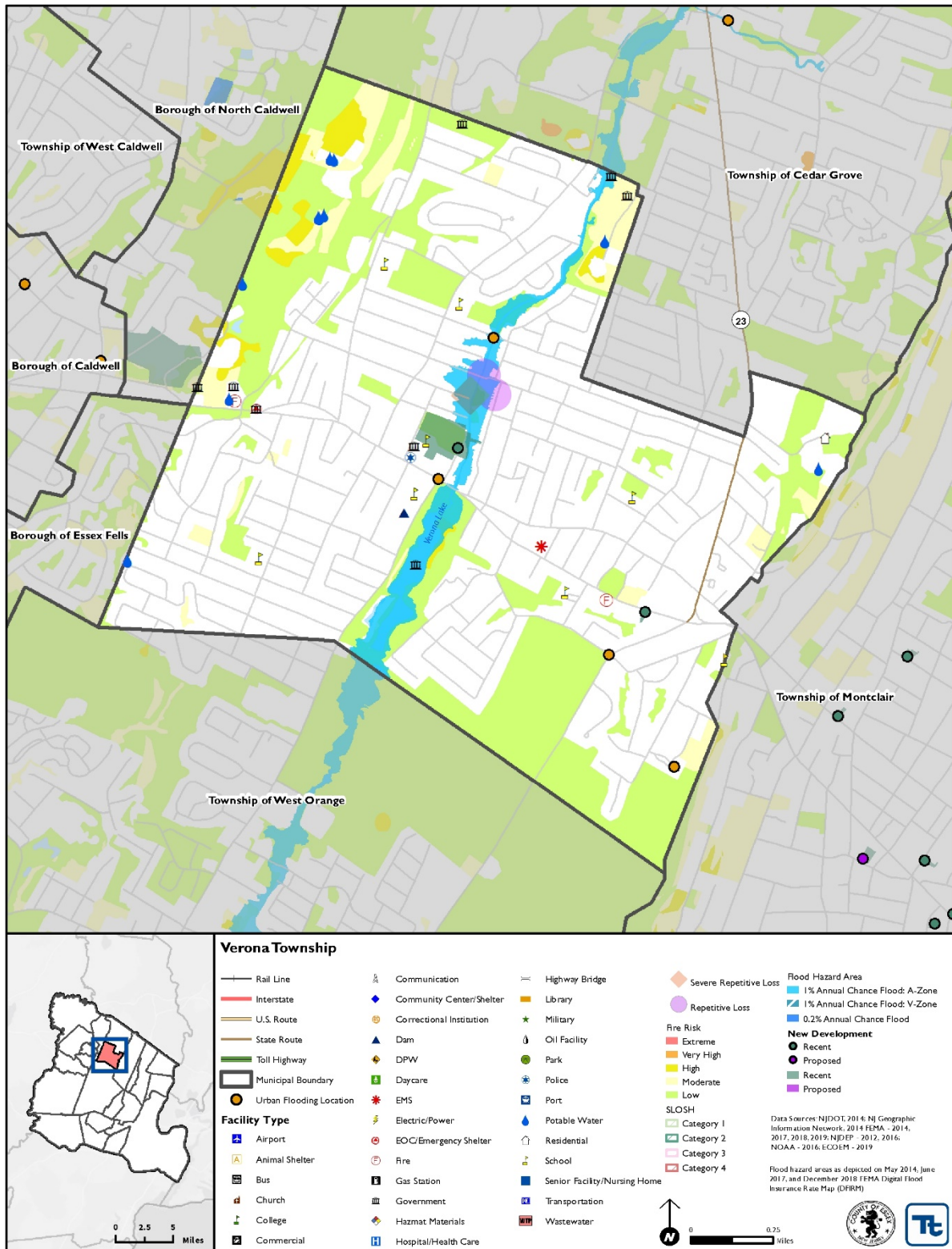
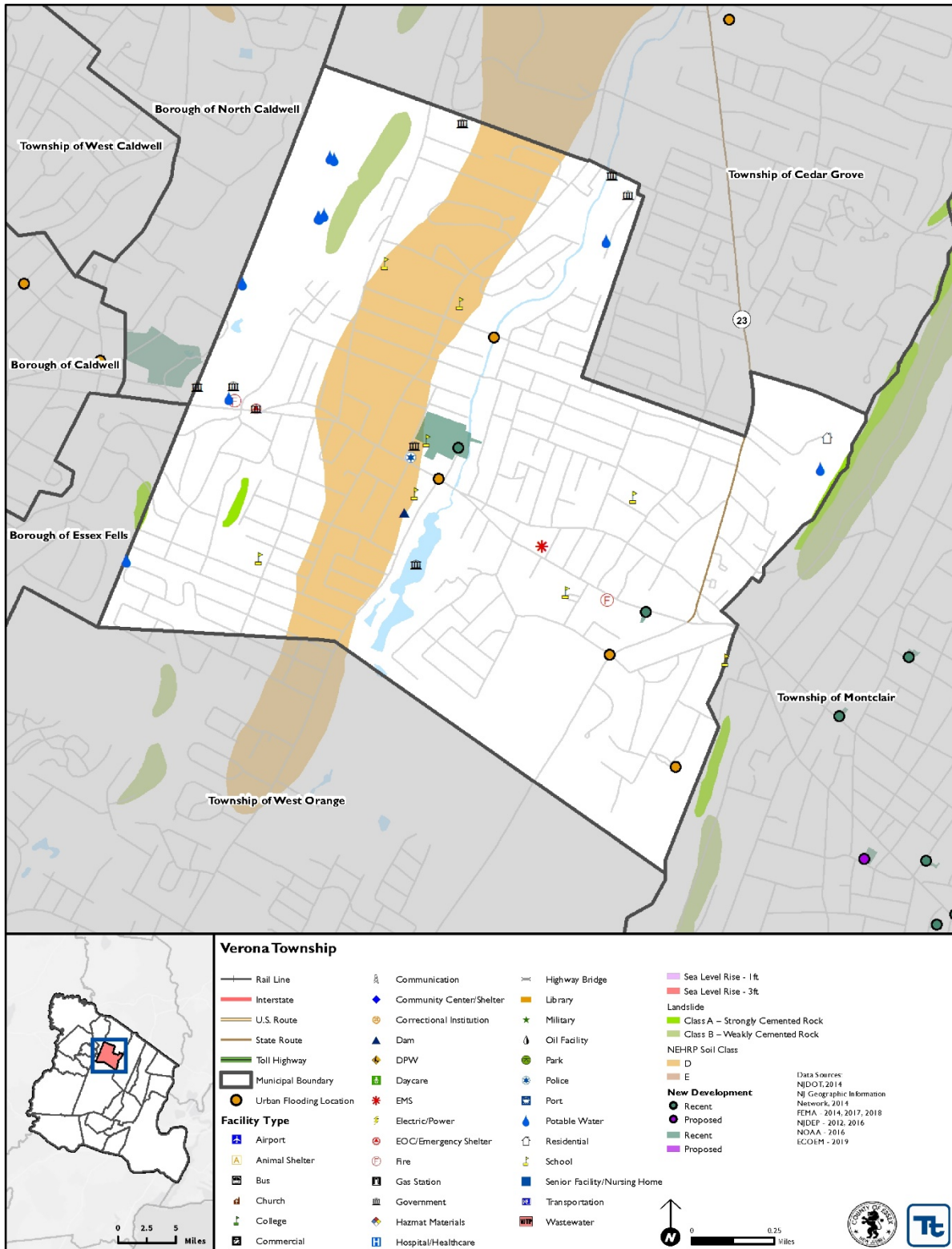




Figure 9.21-2. Township of Verona Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Peckman River Flood Study		
Project Number:	2020-Verona-010		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The Peckman River flows through the Township of Verona and when it floods, it affects many 50-60 homes outside of a FEMA Delineated flood area.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township of Verona will gather information and submit for FEMA Hazard Mitigation Grant Funding for a flood study of the Peckman River and its tributaries that run through the Township. The best identified alternative will be implemented.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD By Study	Estimated Benefits (losses avoided):	Reduction in flood risk to structures affected by flooding of the Peckman River.
Useful Life:	TBD By Study	Goals Met:	1,2,3
Estimated Cost:	TBD By Study	Mitigation Action Type:	Local Plan and Regulation, Structure and Infrastructure Project, Natural Systems Protection
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 HMA, BRIC, Capital Improvements, USACE, NJDEP
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation Planning, Floodplain Management
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Acquire homes out of the floodplain	\$18,000,000	May adversely impact municipal tax base
	Floodproof or elevate all homes	\$10,000,000	May not fully reduce flood impacts on homes being affected by 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:	Peckman River Flood Study	
Project Number:	2020-Verona-010	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will protect homes and families impacted by flooding by the Peckman River.
Property Protection	1	Project will protect buildings impacted by flooding by the Peckman River.
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	Township will need to work with property owners to implement a project
Fiscal	0	Will require additional grant funding for this project
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	Flood, severe storm
Timeline	1	
Agency Champion	0	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Emergency Generators for Verona Schools		
Project Number:	2020-Verona-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	Verona schools currently do not have backup power and therefore lack operational capabilities during power outage. These are identified Critical Facilities.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will work to secure grant funding for the installation of generators at the schools.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	500-Year Flood Event	Estimated Benefits (losses avoided):	Continuity of Operations
Useful Life:	19	Goals Met:	2, 6
Estimated Cost:	\$500,000	Mitigation Action Type:	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 Years
Estimated Time Required for Project Implementation:	Within 5 Years	Potential Funding Sources:	FEMA HMA, BRIC, Capital Improvements
Responsible Organization:	Township OEM, Township Administration	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation Planning, Floodplain Management
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Solar Panel installation	\$200,000	May not be technically feasible
	Establish Microgrids in Verona	\$2,000,000+	May not fully reduce flood impacts on structure
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Emergency Generators for Verona Schools	
Project Number:	2020-Verona-009	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Preserves continuity of operations.
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	0	Utility Interruption
Timeline	0	Within 5 years
Agency Champion	0	
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Mitigation the Building and Grounds Building		
Project Number:	2020-Verona-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The Verona Building and Grounds facility is a critical facility and identified lifeline located in the 1% and 0.2% annual chance flood areas.		
Action or Project Intended for Implementation			
Description of the Solution:	In order to effectively mitigate the Building and Grounds facility, the Township would require the purchase of new land and the construction of a new structure outside of the floodplain.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	500-Year Flood Event	Estimated Benefits (losses avoided):	Reduction in flood risk to Building and Grounds facility.
Useful Life:	25 Year	Goals Met:	2
Estimated Cost:	\$750,000	Mitigation Action Type:	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 Years
Estimated Time Required for Project Implementation:	Within 5 Years	Potential Funding Sources:	FEMA HMA, BRIC, Capital Improvements
Responsible Organization:	Township Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation Planning, Floodplain Management
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Relocate facility	\$2,000,000	May not be technically feasible
	Use green stormwater infrastructure to reduce flood risk	\$10,000	May not fully reduce flood impacts on structure
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 the Building and Grounds Building	
Project Number:	2020-Verona-007	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Protects the Building and Grounds Building from damages.
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	0	Flood, severe storm
Timeline	1	
Agency Champion	0	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	



TOWNSHIP OF WEST CALDWELL

MUNICIPALITY AT A GLANCE

Total Population: **10,932**

Total Land Area: **5.1 sq mi**

Total # Buildings: **3,730**



1% Annual Chance Flood



132

Population Residing
in Floodplain



26

Persons That
May Seek Shelter



\$22.7 Million

Potential
Building Damages



0

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$1.5 Million

Potential Building Damages

NFIP Statistics



86 # NFIP
Policies

3 # SRL NFIP
Properties

1 # RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

All Natural and Non-
Natural Hazards

Project Types

Prevention, Property Protection, Public
Education/Awareness, Natural Resource
Protection, Emergency Services, Structural
Projects, Climate Resilience, Community
Capacity Building

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9.22 TOWNSHIP OF WEST CALDWELL

This section presents the jurisdictional annex for the Township of West Caldwell. The annex includes a general overview of the Township of West Caldwell; an assessment of the Township’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.

9.22.1 Hazard Mitigation Planning Team

The following individuals are the Township of West Caldwell’s identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.22-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Larry Peter, Emergency Management Coordinator Address: 30 Clinton Road, West Caldwell, NJ 07006 Phone Number: 973-747-9946 Email: lpeter@westcaldwell.com	Name / Title: John Medina, Deputy Emergency Management Coordinator Address: 30 Clinton Road, West Caldwell, NJ 07006 Phone Number: 973-226-2300 Email: jmedina@westcaldwell.com
NFIP Floodplain Administrator	
Name / Title: Robert McLoughlin, Construction Official Address: 30 Clinton Road, West Caldwell, NJ 07006 Phone Number: 973-226-2300 Email: rmcloughlin@westcaldwell.com	

9.22.2 Jurisdiction Profile

The Township of West Caldwell was part of the original land known as Horseneck. In 1798, Horseneck was renamed Caldwell Township for James Caldwell- an aid to George Washington’s men during the Revolutionary War. In 1904, the population of Caldwell Township had grown so significantly that forming smaller governing bodies was essential. As a result, West Caldwell Township was formed. The first mayor of West Caldwell Township was Caleb Crane (Township of West Caldwell, 2014).

According to the U.S. Census Bureau, the Township has a total land area of 5.07 square miles, of which 5.055 square miles is land and 0.015 square miles is water. West Caldwell operates with a Mayor and Council consisting of six members in the Borough form of government. The Mayor is elected to a four-year term and each of the six Council members is elected to a three year term. Each Council member chairs one of the Township’s six committees (Township of West Caldwell, 2014).

According to the U.S. Census, the 2010 population for the Township of West Caldwell was 10,759. The estimated 2017 population was 10,932, a 1.6 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.2 percent of the population is 5 years of age or younger and 22.5 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.

9.22.3 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 9.22-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.22-1 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.22-2. 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	10	3	0	2	2
Multi-Family	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	1	5	3
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Bloomfield Avenue Rehabilitation Project	-	-	-	-	-
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

* Only location-specific hazard zones or vulnerabilities identified.

9.22.4 Capability Assessment

The Township of West Caldwell 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.

Areas that mitigation is currently integrated are summarized in this subsection. The Township of West Caldwell 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 Caldwell.



Table 9.22-3. 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 and State	Yes	Yes/No	Yes/No
<i>Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14</i>					
Zoning Code	Yes	Local and State	Yes	Yes	-
<i>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 XX Zoning of the municipal code. This ordinance specifically prevents structures with certain zoning classifications from being built within a flood hazard area.</i>					
Subdivisions	Yes	Local and State	Yes	No	-
<i>Comment: 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 XIX Subdivision of Land of the municipal code. This ordinance prevents lots being platted for residential use in flood hazard areas.</i>					
Stormwater Management	Yes	Local	Yes	No	-
<i>Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter XXIA Stormwater Management and Control of the municipal code. Chapter XXIA of Municipal Code. The Township has identified minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development</i>					
Post-Disaster Recovery	No	-	-	-	-
<i>Comment:</i>					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
<i>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.</i>					
Growth Management	No	-	Yes	No	-
<i>Comment: State mandated at local level</i>					
Shoreline Development	No	-	Yes – if coastal community	-	-
<i>Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.</i>					
Site Plan Review	Yes	Local	Yes	No	-
<i>Comment: Chapter XXIVIII A Land Use Procedures 18A-9 Subdivision and Site Plan Review and Approval of the municipal code.</i>					
Environmental Protection	No	-	Yes	No	-
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					



Codes, Ordinances, & Requirements					
Flood Damage Prevention	Yes	Local	No	No	-
<i>Comment: Chapter XXI Floodplain and Storm Water Management of the municipal code.</i>					
Wellhead Protection	No	-	No	-	-
<i>Comment:</i>					
Emergency Management	Yes	Local	No	-	-
<i>Comment: Chapter III Police Department, Chapter IV Fire Department of the municipal code.</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
<i>Comment:</i>					
Capital Improvement Plan	Yes	Local	Allowed	No	-
<i>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 included as line items within the annual municipal budget, and a 6 year plan is also adopted within the budgeting process.</i>					
Disaster Debris Management Plan	No	-	No	No	2020-Township of West Caldwell-005
<i>Comment: The Township of West Caldwell does not have a Disaster Debris Management Plan, but has expressed interested in creating a debris management plan. See 2020-Township of West Caldwell-005 for additional information.</i>					
Floodplain or Watershed Plan	No	-	No	No	-
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	No	-
<i>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).</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	NO	-
<i>Comment:</i>					
Urban Water Management Plan	No	-	No	-	-
<i>Comment:</i>					
Habitat Conservation Plan	No	-	No	-	-
<i>Comment:</i>					
Economic Development Plan	No	-	No	-	-
<i>Comment:</i>					
Shoreline Management Plan	No	-	No	-	-



Codes, Ordinances, & Requirements					
<i>Comment:</i>					
Community Wildfire Protection Plan	No	-	No	-	-
<i>Comment:</i>					
Community Forest Management Plan	No	-	No	-	-
<i>Comment:</i>					
Transportation Plan	No	-	No	-	-
<i>Comment:</i>					
Agriculture Plan	No	-	No	-	-
<i>Comment:</i>					
Climate Action Plan	No	-	No	-	-
<i>Comment:</i>					
Tourism Plan	No	-	No	-	-
<i>Comment:</i>					
Business Development Plan	No	-	No	-	-
<i>Comment:</i>					
Redevelopment Plan	Yes	Local	No	No	-
<i>Comment: The West Caldwell Redevelopment Plan focuses on the "Area in Need of Rehabilitation" which was prepared in accordance with the New Jersey Local Redevelopment and Housing Law N.J.S.A. 40A:12A et seq. It should be noted this redevelopment plan applies only to a limited area, which is the subject of proposed redevelopment.</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	-
<i>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. West Caldwell's most recent emergency operations plan was approved on February 14, 2017.</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment:</i>					
Post-Disaster Recovery Plan	No	Local	No	-	-
<i>Comment:</i>					
Continuity of Operations Plan	No	Local	No	-	-
<i>Comment:</i>					
Public Health Plan	Yes	Local	No	No	-
<i>Comment:</i>					
Other	-	-	-	-	-
<i>Comment:</i>					

Table 9.22-4. Development and Permitting Capability

Criterion	Response
-----------	----------



Does your jurisdiction issue development permits?	Yes, Planning Board, Construction Department Issues Permits (and inspects)
- If no, who does? If yes, which 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, minimal open land is left

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of West Caldwell.

Table 9.22-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board/Zoning Board of Adjustment
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes/No	Open Space Committee
Economic Development Commission / Committee	Yes	West Caldwell Planning
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle, Swift 911, Municipal Website, TV 36 (Local Access Channel)
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Surrounding Communities, County, State
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning/Engineering (Board Engineer, Municipal Engineer)
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineering
Planners or engineers with an understanding of natural hazards	Yes	Planning/ Engineering
Staff with training in benefit/cost analysis	Yes	Finance
Staff with training in green infrastructure	Yes	Engineering (Maser Consulting)
Staff with education/knowledge/training in low impact development	Yes	Engineering (Maser Consulting)
Surveyors	Yes	Engineering
Stormwater engineer	Yes	Engineering (Maser Consulting)
Personnel skilled or trained in GIS applications	Yes	Engineering (Maser)
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Office of Emergency Management
Grant writers	Yes	Employees write grants on behalf of their own departments
Resilience Officer	No	-
Watershed planner	Yes	Engineering (Maser Consulting)
Environmental specialist	Yes	Engineering (Maser Consulting)



Staff/Personnel Resource	Available?	Department/Agency/Position
Other	Yes	DPW, Fire officials

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of West Caldwell.

Table 9.22-6. 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 (Water, Sewer for Commercial Properties)
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)	Yes
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Township of West Caldwell.

Table 9.22-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, designated as needed
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; 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.	Yes; TV-36, Municipal Website, Nixle, Swift 911, Facebook, Special Notices with Water Bills
Do you have any established warning systems for hazard events? If yes, briefly describe.	Yes; Nixle, Swift911, fire sirens

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of West Caldwell.



Table 9.22-8. 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	October 23, 2017
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	None	03/03/2011

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.

Table 9.22-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storm	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Severe Weather	High
Winter Storm	High
Wildfire	Low
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak	High
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure	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 9.22-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction (in conjunction with Consultant)
Who is your floodplain administrator? (name, department/position)	Construction Official / Floodplain Coordinator
Are any certified floodplain managers on staff in your jurisdiction?	Yes (Consultant)
What is the date that your flood damage prevention ordinance was last amended?	Insert appropriate information
Does your floodplain management program meet or exceed minimum requirements? <ul style="list-style-type: none"> If exceeds, in what ways? 	Meet
When was the most recent Community Assistance Visit or Community Assistance Contact?	Visits take place annually
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? <ul style="list-style-type: none"> If so, state what they are. 	None that the township is aware of
Are any RiskMAP projects currently underway in your jurisdiction? <ul style="list-style-type: none"> If so, state what they are. 	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? <ul style="list-style-type: none"> If no, state why. 	Yes, currently being updated
Does your floodplain management staff need any assistance or training to support its floodplain management program?	No
<input type="checkbox"/> If so, what type of assistance/training is needed?	-
Does your jurisdiction participate in the Community Rating System (CRS)? <ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? If no, is your jurisdiction interested in joining the CRS program? 	No, the township would be open to receiving additional information on the CRS program
How many flood insurance policies are in force in your jurisdiction?*	Flood insurance policies: 86
<ul style="list-style-type: none"> What is the insurance in force? What is the premium in force? 	Insurance in force: \$30,516,800 Premium in force: \$142,916
How many total loss claims have been filed in your jurisdiction?*	Total loss claims: 47
<ul style="list-style-type: none"> How many claims are still open or were closed without payment? What were the total payments for losses? 	Claims still open or closed without payment: 14 Total payments for losses: \$2,000,067
Do you maintain a list of properties that have been damaged by flooding?	May have it within CAD reports
Do you maintain a list of property owners interested in flood mitigation?	No

*According to FEMA statistics as of 03/31/19

ADDITIONAL AREAS OF EXISTING INTEGRATION

Code Enforcement Department: The West Caldwell Code Enforcement Department (commonly known as the Building Department) is staffed by a combination of full-time, part-time, and private industry professionals. All department inspectors are licensed by the State of New Jersey to maintain a Class 1 rating, the highest offered by the State.

Engineering, Planning, and Zoning: The West Caldwell Engineering Department, which includes Engineering, Planning and Zoning, provides a broad range of services for our residents, including the planning, design and construction management of municipal improvements, site plan review, management of our comprehensive recycling program, inspection of new subdivisions and site improvements, maintenance of maps and records, preparation of grant applications, coordination with public works and water department, and residential services to assist homeowners solve a variety of problems. In the areas of Planning and Zoning, the





department provides zoning inspections and enforcement, master plan review and preparation and the processing of all site plan, subdivision and variance applications heard by the Planning Board and Board of Adjustment.

Planning Board and Zoning Board of Adjustment: The members of the Planning Board and the Zoning Board of Adjustment are appointed by the Mayor with concurrence of the Council and play an important role in the development of the town. Generally, the Planning Board deals with commercial development, and the Zoning Board with residential variances.

Fire Prevention Bureau: The mission of the West Caldwell Fire Prevention Bureau is to preserve and enhance the quality of life for the citizens of West Caldwell, through the application of comprehensive fire and hazard prevention programs. The goals of the bureau are:

- To raise public awareness of fire safety considerations. This is accomplished through various educational programs offered to all populations within the community.
- To identify and cause the abatement of fire hazards through a comprehensive inspection program.
- To verify the proper operation and maintenance of all fire protection systems or devices.

Health Department: The mission of the West Caldwell Health Department is to improve the health and quality of life of the citizens of West Caldwell, North Caldwell and Fairfield through the use of health promotion strategies, health protection strategies, preventive services and community health surveillance.

Public Works: The mission of the West Caldwell Department of Public Works (DPW) is to maintain, repair and, whenever possible, improve the infrastructure of our community. This includes maintenance and repair of Township roads, sidewalks, parking lots, parks, buildings, sewers and the municipal fleet of cars and trucks. The department also handles special pickup of debris.

Water Utility: The West Caldwell water system consists of over 55 miles of pipeline, 480 fire hydrants and serves over 3700 residential and commercial properties. The system is maintained and operated by the West Caldwell Water Department. The department conducts routine sampling of the system to assure that our water meets all state and federal standards.

Office of Emergency Management: The Office of Emergency Management is responsible for coordinating efforts to protect lives and property during times of emergencies. This has been accomplished by creating the "Township of West Caldwell Emergency Operations Plan." The plan was approved by the New Jersey State Police on August 9, 1991 and was thereby instituted as the Township's guide for emergency response. This plan is constantly being revised and updated to maintain and raise the standards by which the Township measures its effectiveness.

Sustainable Essex Alliance: The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and



Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

9.22.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of West Caldwell’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County; refer to Appendix E (Risk Assessment Supplement). Table 9.22-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.22-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph. Newark Airport ASOS observations showed blizzard conditions, with visibility less than one quarter mile in heavy snow and frequent wind gusts over 35 mph through the day and into the early evening on Saturday January 23rd.	\$45,765.81 was obligated for through FEMA’s Public Assistance Program for municipal expenses occurred. FEMA reimbursed \$34,324.36.
March 6-7, 2018	Severe Winter Storm, 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. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. Trained spotters and the public reported 1 to 2 feet of snow. 23.0 inches was reported in North Caldwell and 19.7 inches in Roseland. The heavy wet snow	\$199,682.01 was spent by West Caldwell Township on Debris Collection and disposal of vegetative debris. FEMA reimbursed \$148,044.84



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			and strong winds also brought down trees and some power lines.	

9.22.6 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 9.22-12 summarizes the Township of West Caldwell risk assessment results and data used to determine the hazard ranking.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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 9.22-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind Category 1 through Category 4 SLOSH	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$1,450,364	High
		Category 2:	0	Category 2:	0			
		Category 3:	0	Category 3:	0	500-year Wind Loss:	\$8,469,070	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	3,700	NEHRP D&E:	1,267	100-year Loss:	\$0	High
		Liquefaction Class 4:	190	Liquefaction Class 4:	66	500-year Loss:	\$3,880,288	
						2,500-year Loss:	\$59,314,601	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	2,462	Physical 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.		Low
		Population Below Poverty Level:	331					
Flood	100- and 500-Year Mean Return Period Event	100-year	132	100-year	46	100-year Loss:	\$22,672,000	High
		500-year	326	500-year	114			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	0	Class B:	0	Class B:	\$0	



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	14	Wildfire:	5	Wildfire:	\$10,550,659	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/run down.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	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
Utility Interruption	Disruption of power caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of West Caldwell.

- Number of repetitive loss (RL) properties: 4
- Number of severe repetitive loss (SRL) properties: 1
- Number of RL/SRL properties that have been mitigated: 0

*Note: The number of SRL properties excludes RL properties.
 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).*

CRITICAL FACILITIES AND LIFELINES

There are no identified critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.22-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
None				

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Severe storms, severe winter weather, and traffic accidents can lead to downed trees and wires causing power outage around the township. A lack of backup power at critical facilities means that there are impacts to the continuity of operations needed during an emergency or long-term power outage.
- Severe storms and severe winter storms cause an increased amount of debris that must be collected and disposed of. West Caldwell currently has a permitted site for debris disposal but does not have a standalone debris management plan. West Caldwell does not the administrative capability, and allocated funding to develop a debris management plan on their own.
- Traffic, public safety, and commerce interruptions
- Severe storm, severe winter, and flooding cause interruption of traffic signals, which places an increased demand on police personnel to direct traffic when traffic lights are not functioning.
- Gardens Section of the township has stormwater runoff due to an increasing amount of high intensity short duration rainfall events because of inadequate stormwater infrastructure.
- West Caldwell’s Sanitary Sewer System is aging and cannot handle the increased stormwater runoff. This is causing stormwater infiltration into sanitary sewer system leading to sanitary sewer backups into residential structures and increased capacity to the water treatment plant.
- There are 4 repetitive loss and 1 severe repetitive loss property located in the Township.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of West Caldwell 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 Caldwell has significant





exposure; refer to Figures 9.22-1 and 9.22-2. This map also displays the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 (Risk Assessment) of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 West Caldwell. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of West Caldwell has reviewed the Essex County hazard ranking table, as well as its individual calculated results, and adjusted 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 for earthquake from high to medium.
- The Township changed the hazard ranking for flood from low to medium.
- The Township changed the hazard ranking for wildfire from low to medium.
- The Township changed the hazard ranking for cyber attack from low to medium.
- The Township changed the hazard ranking for economic collapse from medium to low.
- The Township changed the hazard ranking for hazardous substances from low to medium.
- The Township changed the hazard ranking for transportation failure from low to medium.

Table 9.22-14. Township of West Caldwell Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Medium	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Low	Medium	High	Low	Medium



9.22.7 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 9.22-15. 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 #
West Caldwell-1: Obtain backup power to ensure continuity of operations. The following have been identified to date: 1. West Caldwell Police station generator project 2. West Caldwell West Essex First Aid Building 3. West Caldwell Municipal 4. West Caldwell Department of Public Works	Township OEM	1. Completed 2017 2. Private Corporation, would work with them, but no jurisdiction 3. Completed, 2018 4. Tied into police generator in 2019	X	2020-Township of West Caldwell-004
West Caldwell-2: Increase stream dumping enforcement	Township Code Enforcement	Ongoing capability		
West Caldwell-3: Stream channel clearing and de-snagging	Township	Ongoing capability		
West Caldwell-4: Construction of a chlorine booster station	Township	Discontinue		
West Caldwell-5: Purchase and replace emergency stand-by generator	Township	Continue	X	2020-Township of West Caldwell-001
West Caldwell-6: Police/Fire/EMS radio system (Police Department).	Police Department	Ongoing capability, pursuing funding (discontinue action)		
West Caldwell-7: Police headquarters building security locks and video monitoring (Police Department).	Police Department	Completed, 2018		
West Caldwell-8: Purchase remote monitoring system for certain roads and intersections (Police Department).	Police Department	Ongoing capability (Discontinue)		
West Caldwell-9: Message sign board (Police Department).	Police Department	Completed, 2016		
West Caldwell-10: Vehicular traffic lane diversion equipment (Police Department).	Police Department	Ongoing capability (Discontinue)		
West Caldwell-11: Laser mapping equipment (Police Department).	Police Department	Ongoing capability (Discontinue)		
West Caldwell-12: Patrol car awning (Police headquarters). (Police Department).	Police Department	Ongoing capability (Discontinue)		
West Caldwell-13: Equip the department classroom (Police Department).	Police Department	Ongoing capability (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	Enter 2020 HMP Action #
West Caldwell-14: Clean and maintain stream culvert between all municipalities.	Township OEM	Ongoing capability (DPW)		
West Caldwell-15: Infiltration study for sanitary sewer system- old pipes, back flow.	Township Engineering, FPA	In progress, some studies have been completed. Transition to continuous process by studying sections	X	2020-Township of West Caldwell-002
West Caldwell-16: Obtain information about becoming a certified Firewise Community due to the potential for forest fires.	Fire Dept	No progress, Discontinue		
West Caldwell-17: Upgrade sanitary sewer system back-ups and overflows.	Township Engineering	In progress, see study progress above.		
West Caldwell-18: Kirkpatrick Lane wastewater pumping stations.	Township Engineering	In progress, renovations for capacity increase	X	2020-Township of West Caldwell-003
West Caldwell-19: 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. Assess and prioritize non-structural flood hazard mitigation alternatives for at risk properties within the floodplain, including those that have been identified as repetitive loss, such as acquisition/relocation, or elevation depending on feasibility. The parameters for feasibility for this initiative would be: funding, benefits versus costs and willing participation of property owners. Implement as funding becomes available.	Township Engineering, FPA	No progress	X	2020-Township of West Caldwell-008

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of West Caldwell participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of West Caldwell and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.



Table 9.22-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of West Caldwell 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 (4) FEMA mitigation action categories and the size (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.22-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.22-18 summarizes the actions by type across hazards of concern.



Table 9.22-16. 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 West Caldwell-001	Purchase and replace emergency stand-by generator	The Municipal Town hall acts as the Emergency Operation Center in the event that the primary EOC (Municipal Police Department) is overwhelmed or if the incident expands in scope and size. The generator is in need of replacement	Purchase 175 KW (or more) diesel GENERAC Automatic Standby Generator with tank capacity of 380 gallons, 24 Hour run time via a 600A 3PH 4W 240/120/3/60 Automatic Transfer Switch.	Existing	Utility Interruption	2, 3, 6	Township	Municipal budget, HMGP	Protection of critical services	High	Within 5 years	High	SIP	PP, ES
2020-Township of West Caldwell-002	Implement identified actions of infiltration study for sanitary sewer system- old pipes.	West Caldwell's Sanitary Sewer System is aging and it's condition may be allowing storm water infiltration into the sanitary sewer system leading to sanitary sewer backups into residential structures and increased capacity to the waste water treatment plant.	West Caldwell has hired a consultant to perform an infiltration study of the sanitary sewer along Forest Avenue. The study will be completed with the next 6- 12 months. West Caldwell will implement the best identified alternative as a result of the study within 12-24 months after the results are completed.	Existing	Severe Storm, Flood, Utility Interruption	2	Township Engineering, FPA	Municipal budget	Reduction in infiltration	High	Within 5 years		SIP	PP
2020-Township of West Caldwell-003	Kirkpatrick Lane wastewater pumping stations	Pump stations do not have enough capacity	Continue renovations for capacity increase	Existing	Utility Interruption	2	Township Engineering	Municipal budget	Increased capacity of pumps	High	Within 5 years	High	SIP	PP
2020-Township of West Caldwell-004	Assist privately owned critical facilities install generators	Continuity of operations of privately-owned critical facilities must be maintained	Assist West Essex First Aid Squad and West Caldwell BOE in identification and purchase of generators.	Existing	Utility Interruption	2, 3, 6	Township, West Essex First Aid Squad and West	Municipal budget	Continuity of operations.	\$200	1 year	High	EA P, SIP	PI, 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
		during occurrences of power outage. West Essex First Aid Squad James Caldwell High School (West Caldwell BOE).					Caldwell BOE							
2020-Township of West Caldwell-005	Develop Debris Management Plan	Severe storms and severe winter storms cause an increased amount of debris that must be collected and disposed of. West Caldwell currently has a permitted site for debris disposal, but does not have a standalone debris management plan.	West Caldwell will work to pursue outside funding to contract with a consultant to develop Debris Management Plan for the Township of West Caldwell.	N/A	Severe Storm, Severe Winter Storm	5, 6	Township	Municipal budget	Plan developed	\$5,000	Within 5 years	High	LP R	ES
2020-Township of West Caldwell-006	Battery backup for traffic lights	Traffic, public safety, and commerce interruptions. Severe storm, severe winter, and flooding cause interruption of traffic signals, which places an increased demand on police personnel to direct traffic when traffic lights are not functioning	West Caldwell Police/OEM in conjunction with Essex County will pursue funding for the implementation of battery backup for traffic lights throughout West Caldwell.	Existing	Severe Storm, Severe Winter Storm, Flood, Utility Interruption, Transportation Failure	6	West Caldwell Police/OEM, Essex County	Municipal budget, HMGP	Traffic signals remain functional during power failure	High	Within 5 years	High	SIP	PP, ES
2020-Township of West Caldwell-007	Increase stormwater system capacity in Gardens section of township	Gardens section of Town (Parkview Avenue, Johnson Avenue) has stormwater runoff due to an increasing amount of high intensity short duration rainfall	West Caldwell will install additional catch-basins and upgrade stormwater pipes to increase stormwater capacity. West Caldwell Engineering is currently determining	New and Existing	Severe Storm, Flood	2	Engineering	Municipal budget, HMGP	Increased stormwater capacity, reduced flooding.	High	Within 5 years	High	SIP	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
		events because of inadequate stormwater infrastructure.	cost and expected scope of work (to be completed within 6 months).											
2020-Township of West Caldwell-008	Mitigate flood-prone properties, including RL/SRL properties	There are 4 repetitive loss and 1 severe repetitive loss property located in the Township.	The Township will conduct public outreach to the RL and SRL properties to identify if there is interest in mitigation (elevation or acquisition). If there is no interest in mitigation, the Township will provide a list of options homeowners can do to protect their home from future flood damage.	Existing	Flood, Severe Storm	1, 2, 3	Floodplain administrator, 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.	\$750,000	3 years	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
- 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 9.22-17. 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 West Caldwell-001	Purchase and replace emergency stand-by generator	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High
2020-Township of West Caldwell-002	Implement identified actions of infiltration study for sanitary sewer system- old pipes.	0	1	0	1	1	1	1	1	1	1	0	0	1	1	10	High
2020-Township of West Caldwell-003	Kirkpatrick Lane wastewater pumping stations	0	1	0	1	1	1	1	1	1	1	0	0	1	1	10	High
2020-Township of West Caldwell-004	Assist privately owned critical facilities install generators	1	1	1	1	1	0	0	1	1	1	0	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-Township of West Caldwell-005	Develop Debris Management Plan	1	1	0	0	1	1	0	1	1	0	1	0	1	1	9	High
2020-Township of West Caldwell-006	Battery backup for traffic lights	1	0	1	1	1	0	1	1	1	1	0	0	1	1	10	High
2020-Township of West Caldwell-007	Increase stormwater system capacity in Gardens section of township	0	1	0	1	1	1	1	1	0	1	1	0	1	1	10	High
2020-Township of West Caldwell-008	Mitigate flood-prone properties, including RL/SRL properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



Table 9.22-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion and Sea Level Rise								
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)		2020-002, 2020-008				2020-002, 2020-007, 2020-008		
Geological Hazards (landslides and subsidence/sinkholes)								
Severe Weather (high wind, tornado, TSTM, and hail)	2020-005	2020-002, 2020-008				2020-002, 2020-008		
Severe Winter Weather (heavy snow, blizzards, and ice storms)	2020-005							
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-001, 2020-002, 2020-003, 2020-006			2020-001, 2020-002, 2020-003, 2020-004, 2020-006	2020-004		
Terrorism								
Transportation Failure								

9.22.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of West Caldwell 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.22-19. Contributors to the Annex

Entity	Title	Method of Participation
Larry Peter	Emergency Management Coordinator	Primary POC
John Medina	Deputy Emergency Management Coordinator	Alternate POC
Vinnie Graziosa	DPW Superintendent	Attended Plan Participant Meetings
Gerard Paris	West Caldwell Police Chief	Attended Plan Participant Meetings
Nikole Baltycki	Township Administrator	Attended Plan Participant Meetings
John Pressler	Water Operator	Attended Plan Participant Meetings
Michael Luker	Fire Chief	Attended Plan Participant Meetings
Bob McLoughlin	Construction Office/ Floodplain Administrator	Attended Plan Participant Meetings



Figure 9.22-1. Township of West Caldwell Hazard Area Extent and Location Map

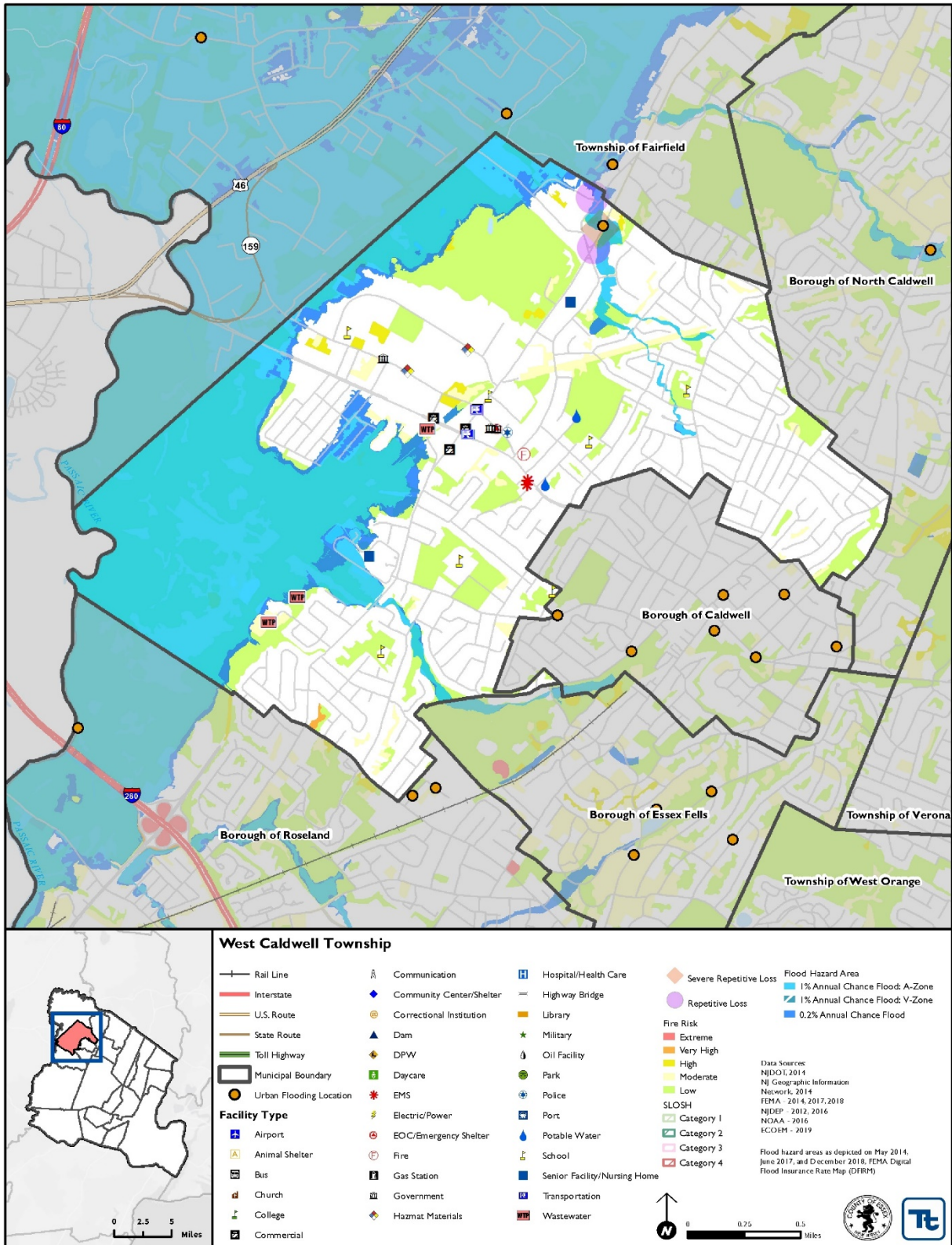
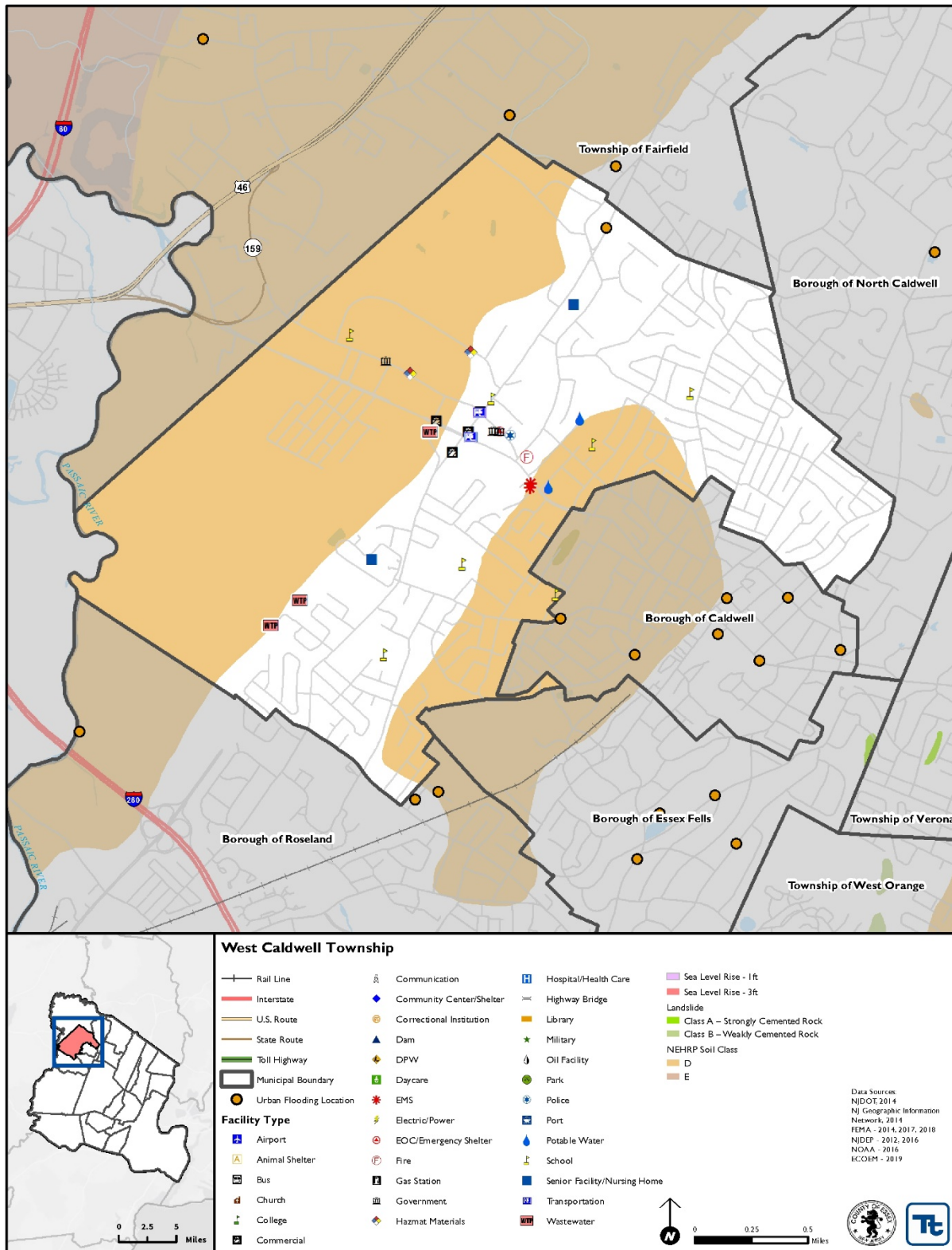




Figure 9.22-2. Township of West Caldwell Hazard Area Extent and Location Map 2





Name of Jurisdiction: Township of West Caldwell

Name and Title Completing Worksheet:

Action Worksheet			
Project Name:	Increase stormwater system capacity in Gardens section of township		
Project Number:	2020-Township of West Caldwell-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Flood		
Description of the Problem:	Gardens section of Town (Parkview Avenue, Johnson Avenue) has stormwater runoff due to an increasing amount of high intensity short duration rainfall events because of inadequate stormwater infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution:	West Caldwell will install additional catch-basins and upgrade stormwater pipes to increase stormwater capacity. West Caldwell Engineering is currently determining cost and expected scope of work (to be completed within 6 months).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD by scope of work	Estimated Benefits (losses avoided):	Increased stormwater capacity, reduced flooding
Useful Life:	50 years	Goals Met:	2
Estimated Cost:	TBD by scope of work	Mitigation Action Type:	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Within 5 year
Estimated Time Required for Project Implementation:	TBD by scope of work	Potential Funding Sources:	Municipal budget, HMGP
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Stormwater Planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	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:			



Name of Jurisdiction: Township of West Caldwell

Name and Title Completing Worksheet: _____

Action Worksheet		
Project Name:	Increase stormwater system capacity in Gardens section of township	
Project Number:	2020-Township of West Caldwell-007	
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 Township has the legal authority to conduct the project.
Fiscal	1	Municipal budget, HMGP
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Township of West Caldwell
 Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-Township of West Caldwell-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages in the Passaic Avenue, Bloomfield Avenue, and Fairfield Crest areas. 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 Passaic Avenue, Bloomfield Avenue, and Fairfield Crest area that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	1% annual chance flood event + freeboard (<i>in accordance with flood ordinance</i>)	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, 3
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:	



Name of Jurisdiction: Township of West Caldwell

Name and Title Completing Worksheet: _____

Action Worksheet		
Project Name:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-Township of West Caldwell-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 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 the Passaic Avenue, Bloomfield Avenue, and Fairfield Crest areas.
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	



Name of Jurisdiction: Township of West Caldwell
 Name and Title Completing Worksheet: _____

Action Worksheet			
Project Name:	Purchase and replace emergency stand-by generator		
Project Number:	2020-Township of West Caldwell-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Township of West Caldwell is seeking funding to purchase and install a permanent natural gas generator for the Municipal Town hall so that it can provide power to critical infrastructure in the event of a power outage. The Municipal Town hall will act as the Emergency Operation Center in the event that the primary EOC (Municipal Police Department) is over whelmed or if the incident expands in scope and size. Neither building can remain open in the event of power failures. The purchase of the generator will allow the Township to manage emergencies more efficiently, therefore, allowing for a smooth coordination of our emergency services.		
Action or Project Intended for Implementation			
Description of the Solution:	(1) 175 KW (or more) diesel GENERAC Automatic Standby Generator with tank capacity of 380 gallons, 24 Hour run time via a 600A 3PH 4W 240/120/3/60 Automatic Transfer Switch.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Prevents power loss	Estimated Benefits (losses avoided):	Protects continuity of operations
Useful Life:	5 years	Goals Met:	2, 3, 6
Estimated Cost:	\$30,000	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:	3 months	Potential Funding Sources:	Municipal budget, HMGP
Responsible Organization:	Township of West Caldwell	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 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:	



Name of Jurisdiction: Township of West Caldwell

Name and Title Completing Worksheet:

Action Worksheet		
Project Name:	Purchase and replace emergency stand-by generator	
Project Number:	2020-Township of West Caldwell-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	With an increase of power outages in the area, it is necessary to install generators at critical facilities within the Township for continuity of operations for emergency responders.
Property Protection	1	Having the ability to keep the Township EOC with power, during power outages, will allow our emergency dispatchers to keep better track of emergency responders and better allocated resources to secure, reduce and eliminate hazards to infrastructure and damage to structures.
Cost-Effectiveness	1	For the small investment of \$121,000; hundreds of thousands of dollars can be saved by the better allocation of resources to secure, reduce and eliminate hazards to infrastructure and damage to structures.
Technical	1	It is technically feasible and meets the Township long-term goals.
Political	1	The Township has applied for HMGP Grant (Application #206 – Project #4086) and is moving through the process. The Township’s Governing Body has already funded the full amount of the project, as it is a reimbursement grant.
Legal	1	Neutral
Fiscal	0	Requires funding support
Environmental	1	The Generator will be permitted and will comply with State Environmental Rules.
Social	1	This project will not negatively affect the population.
Administrative	1	The Township has the administrative capabilities to implement this action and will not require outside help.
Multi-Hazard	0	Utility Interruption
Timeline	0	
Agency Champion	1	Project has been assigned a manager and is being supported by administration. The Township’s Governing Body has already funded the full amount of the project, as it is a reimbursement grant.
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



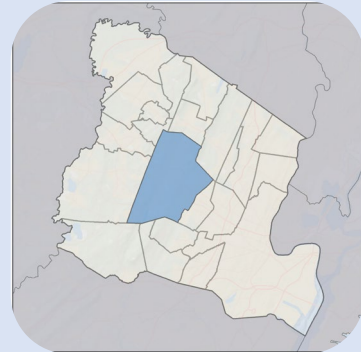
TOWNSHIP OF WEST ORANGE

MUNICIPALITY AT A GLANCE

Total Population: **47,609**

Total Land Area: **12.1 sq mi**

Total # Buildings: **11,845**



1% Annual Chance Flood



1,230

Population Residing
in Floodplain



69

Persons That
May Seek Shelter



\$22.6 Million

Potential
Building Damages



4

Critical Facilities
in Floodplain

100-Year MRP Event Wind Loss



\$4.1 Million

Potential Building Damages

NFIP Statistics



204

NFIP
Policies

11

SRL NFIP
Properties

0

RL NFIP
Properties



Mitigation Action Plan (2020-2025)

Hazard

Flood, Severe Weather,
Winter Weather, Utility
Interruption

Project Types

Prevention, Property Protection,
Emergency Services, Structural Projects

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9.23 TOWNSHIP OF WEST ORANGE

This section presents the jurisdictional annex for the Township of West Orange. The annex includes a general overview of the Township; an assessment of the Township’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.

9.23.1 Hazard Mitigation Planning Team

The following individuals are the Township of West Orange’s identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.23-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Dominic Allegrino / OEM Coordinator Address: Township of West Orange Fire Department, 415 Valley Road, West Orange, NJ 07052 Phone Number: 973-325-4175 Email: nickallegrino@wopd.org	Name / Title: Leonard Lepore / Director, Municipal Engineer Address: Township of West Orange Municipal Building, 66 Main Street, West Orange, NJ 07052 Phone Number: 973-325-4160 Email: llepore@westorange.org
NFIP Floodplain Administrator	
Name / Title: Leonard Lepore / Director, Municipal Engineer Address: Township of West Orange Municipal Building, 66 Main Street, West Orange, NJ 07052 Phone Number: 973-325-4160 Email: llepore@westorange.org	

9.23.2 Jurisdiction Profile

According to the U.S. Census Bureau, the Township has a total land area of 12.171 square miles, of which 12.046 square miles is land and 0.125 square miles is water. The Township of West Orange is in central Essex County and is bordered to the north by the Townships of Montclair and Verona; to the east by the City of Orange; to the south by the Townships of South Orange, Millburn, and Maplewood; and to the west by the Townships of Essex Fells, Roseland, and Livingston.

West Orange was part of the City of Newark until November of 1806. The first planned community in America, Llewellyn Park, is located in West Orange. West Orange operates under the Mayor-Council form of municipal government. Every four years in even-numbered years, two or three council seats along with the mayoral seat are up for re-election. (Township of West Orange 2014). The next mayoral election is in 2022, when two council seats also will be up for election. In 2020, three council seats will be up for election.

According to the U.S. Census, the 2010 population for the Township of West Orange was 46,207. The estimated 2017 population was 47,609, a 3.0 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 5.2 percent of the population is 5 years of age or younger and 17.4 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.

9.23.3 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 9.23-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.23-1 at the end of this annex illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.23-2. 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	12	5	12	7)	unknown
Multi-Family	0	299	0	100	unknown
Other (commercial, mixed-use, etc.)	1	0	0	0	unknown
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					
Harvard Development Urban Renewal Associates	Residential	228 Units	B: 9 L: 56	1% Flood: A Zone	See Orange SP 061113
Harvard Development Urban Renewal Associates	Residential	228 Units	B: 9 L: 50	1% Flood: A Zone	See Orange SP 061113
Harvard Development Urban Renewal Associates	Residential	228 Units	B: 9 L: 1	1% Flood: A Zone	See Orange SP 061113
Harvard Development Urban Renewal Associates	Residential	228 Units	B: 9 L: 7	1% Flood: A Zone	See Orange SP 061113
Harvard Development Urban Renewal Associates	Residential	228 Units	B: 9 L: 44	1% Flood: A Zone	See Orange SP 061113
Prism Green Urban Renewal Associates	Residential	334 units	B: 66 L: 5	None	App/Rej.
Prism Green Urban Renewal Associates	Residential	334 units	B: 66 L: 1	1% Flood: A Zone	App/Rej.
Prism Green Urban Renewal Associates	Residential	334 units	B: 66 L: 7	None	App/Rej.
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Not available					

* Only location-specific hazard zones or vulnerabilities identified.

Note: Development data from <https://www.westorange.org/DocumentCenter/View/5037/Master-Plan-Reexamination-Presentation-3-12-19>. Single Family Units calculated by 1 & 2 Family Units – Residential Demolition Permits.

9.23.4 Capability Assessment

The Township of West Orange 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.

Areas that mitigation is currently integrated are summarized in this subsection. The Township of West Caldwell 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 Orange.

Table 9.23-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	Township of West Orange	Construction Official	State	Yes	No	No
<i>Comment: West Orange Revised General Ordinance (WORG) 13-1; State adopted codes-10/2010</i>							
Zoning Code	Yes	Township of West Orange	Zoning Official	No	Yes	Yes	-
<i>Comment: Land Use Regulations of the Township of West Orange. WORG 25. Adopted June 26, 2012; effective July 16, 2012. Land use policies discourage development in hazard areas.</i>							
Subdivisions	Yes	Township of West Orange	Planning and Zoning Boards	No	Yes	No	No
<i>Comment: The Land Subdivision Ordinance of the Township of West Orange. WORG 32.</i>							
Stormwater Management	Yes	Township of West Orange	Municipal Engineer	NJDEP	Yes	No	No
<i>Comment: WORG 25-29.1</i>							
Post-Disaster Recovery	No	-	-	-	No	-	-
<i>Comment:</i>							
Real Estate Disclosure	No	-	-	-	No	-	-
<i>Comment:</i>							
Growth Management	No	-	-	-	No	-	-
<i>Comment:</i>							
Site Plan Review	Yes	Township of West Orange	Planning and Zoning Boards	No	Yes	No	No
<i>Comment: WORG 25</i>							
Environmental Protection	No	-	-	-	No	-	-
<i>Comment:</i>							
Flood Damage Prevention	Yes	Township of West Orange	Construction Official	FEMA	No	Yes	-
<i>Comment: WORG 24</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? 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	-	-	-	No	-	-
<i>Comment:</i>							
Climate Change	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Recovery Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Disaster Reconstruction Ordinance	No	-	-	-	No	-	-
<i>Comment:</i>							
Other Ordinances in Land Use	Yes	Township of West Orange	Planning and Zoning Boards	No	No	No	No
<i>Comment: Conservation District (WORGO 25-26), Tree Protection and Removal (WORGO 25-27), Steep Slope and Natural Features (WORGO 25-28), Historic Preservation Commission WORGO 25-30.</i>							
Planning Documents							
Comprehensive / Master Plan	Yes	Township of West Orange	Planning Department	No	Yes	No	Yes
<i>Comment: The Township's Planning Board is preparing a Master Plan Update available at http://westorange.org/527/Planning-Board.</i>							
Capital Improvement Plan	Yes	Township of West Orange	Finance	Yes/No	Yes/No	Yes/No	Yes/No
<i>Comment: Competed annually for a 5 year period.</i>							
Disaster Debris Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Floodplain or Watershed Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Stormwater Management Plan	Yes	Township of West Orange	Engineer	NJDEP	Yes	No	No
<i>Comment: Stormwater Management Plan and Stormwater PPP</i>							
Stormwater Pollution Prevention Plan	Yes	Township of West Orange	Engineer	NJDEP	Yes	No	No
<i>Comment: Stormwater Management Plan.</i>							
Urban Water Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Habitat Conservation Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Economic Development Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Shoreline Management Plan	No	-	-	-	No	-	-
<i>Comment:</i>							



	Do you have this? (Yes/No)	Is this applicable Countywide or for a specific jurisdiction? If jurisdiction specify which one	Local Authority	Other Jurisdiction Authority and specify (e.g., District, State, Federal)	State Mandated	Has this been integrated? If yes- how?	
						If yes-how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Community Wildfire Protection Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Forest Management Plan	Yes	Township of West Orange	Forester	DEP	No	Yes/No	Yes/No
<i>Comment: Community Forestry Management Plan</i>							
Transportation Plan	Yes	Township of West Orange	Planning	No	No	Yes/No	Yes/No
<i>Comment: Circulation Element of The Master Plan Amendment (2016). Complete Streets Concept Plan (2015). Pedestrian Safety Action Plan (2015).</i>							
Agriculture Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Climate Action Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Tourism Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Business Development Plan	No	-	-	-	No	-	-
<i>Comment:</i>							
Other: Open Space and Recreation Plan	Yes	Township of West Orange	Municipal Engineer and Planning Director and Open Space Committee	No	No	No	No
<i>Comment: Published 2010, Update March 12, 2019. https://www.westorange.org/DocumentCenter/View/5038/Open-Space--Recreation-Plan-Update-Presentation-3-12-19</i>							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of West Orange	OEM	County, State	Yes	No	No
<i>Comment: Emergency Operations Plan</i>							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-	-	-
<i>Comment:</i>							
Post-Disaster Recovery Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Continuity of Operations Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Public Health Plan	No	-	-	-	-	-	-
<i>Comment:</i>							
Other:	No	-	-	-	-	-	-
<i>Comment:</i>							



Table 9.23-4. 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
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 land inventory of lots ½ acre or larger, including lists of environmental constraints

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of West Orange.

Table 9.23-5. 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 Committee
Open Space Board / Committee	Yes	Open Space Commission
Economic Development Commission / Committee	Yes	Economic Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	SwiftReach
Maintenance program to reduce risk	Yes	DPW for municipal streets (not county or state roads)
Mutual aid agreements	Yes	Fire, EMS, Police
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Public Works & Planning
Engineers or professionals trained in building or infrastructure construction practices	Yes	Public Works & Building Department
Planners or engineers with an understanding of natural hazards	Yes	Public Works & Building Department
Staff with training in benefit/cost analysis	Yes	Public Works & Finance
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyors	Yes	Outside Contractors
Stormwater Engineer	No	-
Personnel skilled or trained in GIS applications	Yes	Public Works
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed Planner	No	-
Environmental Specialist	No	-



Staff/Personnel Resource	Available?	Department/Agency/Position
Grant writers	Yes	Outside Contractors
Resilience Officer	No	-
Other Community Emergency Response Team	Yes	OEM

FISCAL CAPABILITY

The table below summarizes financial resources available to the Township of West Orange.

Table 9.23-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes, Public Works
Capital Improvements Project Funding	Yes, Public Works
Authority to Levy Taxes for Specific Purposes	Yes, Finance
User Fees for Water, Sewer, Gas or Electric Service	Yes, Finance
Incur Debt through General Obligation Bonds	Yes, Finance
Incur Debt through Special Tax Bonds	Yes, Finance
Incur Debt through Private Activity Bonds	Yes, Finance
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes, Finance
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 Township of West Orange.

Table 9.23-7. 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, Contractor
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes. OEM website https://www.westorange.org/552/Office-of-Emergency-Management
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes. Facebook, township website
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes. Community Emergency Response Site, Environmental Committee
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes. Street fair tabling with information. Electronic boards at Town Hall and West Orange High School. TV 36 local feed.
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes. SwiftReach

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Township of West Orange.





Table 9.23-8. 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	2018
Storm Ready Certification	No	_____	-
Firewise Community Classification	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 Township's Planning Board is preparing a Master Plan Update that includes an updated Green Buildings and Sustainability Plan Element, which has some discussion and recommendations related to this topic. The draft is available at <http://westorange.org/527/Planning-Board>. Table 9.23-9 summarizes the adaptive capacity for climate change and the jurisdiction’s rating.

Table 9.23-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storm	Medium
Drought	Low
Earthquake	Medium
Extreme Temperature	Medium
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Low
Severe Storm (<i>high wind, tornado, TSTM, and hail</i>)	Medium
Winter Storm (<i>heavy snow, blizzards, and ice storms</i>)	Medium
Wildfire	Low
Civil Disorder	Low
Cyber Attack	Low
Disease Outbreak	Medium
Economic Collapse	Low
Hazardous Substances	Low
Utility Interruption	Medium
Terrorism	Low
Transportation Failure	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 9.23-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (department/position)	Engineering
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	Insert appropriate information
Does your floodplain management program meet or exceed minimum requirements?	Meet
<ul style="list-style-type: none"> If exceeds, in what ways? 	N/A
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAV: 07/20/1993 GTA: 04/29/2013
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?	No
<ul style="list-style-type: none"> If so, state what they are. 	N/A
Are any RiskMAP projects currently underway in your jurisdiction?	No
<ul style="list-style-type: none"> If so, state what they are. 	N/A
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	No
<ul style="list-style-type: none"> If no, state why. 	Some error might exist.
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes
<ul style="list-style-type: none"> If so, what type of assistance/training is needed? 	CFM training
Does your jurisdiction participate in the Community Rating System (CRS)?	No
<ul style="list-style-type: none"> If yes, is your jurisdiction interested in improving its CRS Classification? 	N/A
<ul style="list-style-type: none"> If no, is your jurisdiction interested in joining the CRS program? 	No
How many flood insurance policies are in force in your jurisdiction? ^a	197
<ul style="list-style-type: none"> What is the insurance in force? 	\$53,500,400
<ul style="list-style-type: none"> What is the premium in force? 	\$335,849
How many total loss claims have been filed in your jurisdiction? ^a	151
How many claims are still open or were closed without payment?	0
What were the total payments for losses?	\$901,606.21
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

^aPolicies 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.

ADDITIONAL AREAS OF EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Township of West Orange made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:

- The Township of West Orange participates in the Sustainable Jersey program and achieved Bronze certification. Actions for certification on November 1, 2019 with 250 points were provided in the certification report at <http://www.sustainablejersey.com/certification/participating->





[communities/certification-report/?tx_sjcert_certification%5Bcertification%5D%5B_identity%5D=805&tx_sjcert_certification%5Baction%5D=show&tx_sjcert_certification%5Bcontroller%5D=Certification&cHash=49abc319ba7214281ebd17dc70539534](https://www.essexnj.gov/communities/certification-report/?tx_sjcert_certification%5Bcertification%5D%5B_identity%5D=805&tx_sjcert_certification%5Baction%5D=show&tx_sjcert_certification%5Bcontroller%5D=Certification&cHash=49abc319ba7214281ebd17dc70539534).

9.23.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.3 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Township of West Orange’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County; refer to Appendix E (Risk Assessment Supplement). Table 9.23-11 provides details regarding municipal-specific loss and damages the Township experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.23-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard DR-4264	Yes	Low pressure moving across the deep South on January 21 and January 22 intensified and moved off the Mid Atlantic coast on January 23, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas. At Newark Airport, the storm total snowfall was 24.5 inches, where winds gusted to 39 mph.	The Township did not report any losses for this event.
7/14/16	Thunderstorm Wind	No	A line of strong to severe storms moved across Northeast New Jersey. A large tree snapped and landed on a car on Maple Street just east of West Orange. \$7.5K in property damages were reported. A large tree snapped and fell on a fence between West Orange and Glen Ridge. \$2K in property damages were reported. A tree fell on a car along Branch Brook Drive just west of Belleville. \$6K in property damages were reported.	The Township did not report any losses for this event.
3/2/17	Strong Wind	No	Gusty northwest winds occurred behind a strong cold front. The broadcast media reported a downed tree in West Orange at 819 am. The tree was knocked down onto Prospect Ave.	The Township did not report any losses for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			southbound between Rock Ave. and Route 280. Nearby, Newark International Airport measured a gust to 56 mph at 746 am. \$50K in property damages were reported.	
3/14/17	Winter Storm	No	Rapidly deepening low pressure tracked up the eastern seaboard on March 14, bringing 8 to 13 inches of heavy snow and sleet, along with strong winds across Northeast New Jersey.	The Township did not report any losses for this event.
1/4/18	Winter Storm	No	The low pressure rapidly intensified through January 4, as it moved north-northeast along the coast. The rapid intensification of the storm led to heavy snow, strong winds, and near-blizzard conditions across northeast New Jersey, with 8.4 inches of snow and winds gusts of 44 MPH reported at Newark Liberty Airport.	The Township did not report any losses for this event.
3/7/18	Winter Storm	No	A strong low-pressure system tracked along the coast through late March 7 and early morning on March 8 bringing heavy wet snow, strong gusty winds, and thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times, resulting in 1 to 2 feet, which brought down trees and some power lines.	The Township did not report any losses for this event.
5/15/18	Thunderstorm Wind	No	An approaching cold front triggered numerous severe thunderstorms over northeastern New Jersey. Large trees were reported down in Caldwell. \$4K in property damages were reported. Large tree reported down on Maple Street in West Orange. \$4K in property damages were reported.	The Township did not report any losses for this event.
11/15/18	Winter Storm	No	A wave of low pressure developed along the Middle Atlantic coast November 15. The heavy, wet snow significantly impacted the evening rush hour with 1-2 inch per hour snowfall	The Township did not report any losses for this event.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			rates. Hundreds of trees, tree limbs, and branches were brought down by the weight of the snow, causing many power outages. Newark Airport reported 6.4 inches of snow.	
1/30/19	Strong Wind	No	Strong winds occurred behind low pressure and cold front, with 30 mph sustained winds measured at Caldwell Airport.	The Township did not report any losses for this event.
3/15/19	Thunderstorm Wind, Hail	No	A cold front moved through the region triggering strong to severe thunderstorms across northeast New Jersey.	The Township did not report any losses for this event.

9.23.6 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 9.23-12 summarizes the hazards of greatest concern and risk to the Township of West Orange.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used 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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Township of West Orange.

- Number of repetitive loss (RL) properties: 11
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

*Note: The number of SRL properties excludes RL properties. 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).*



Table 9.23-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$4,063,879	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$28,409,745	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	486	NEHRP D&E:	133	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$4,195,584	
						2,500-year Loss:	\$77,204,865	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	8,277	Physical 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.		Low
		Population Below Poverty Level:	3,576					
Flood	100- and 500-Year Mean Return Period Event	100-year	1,230	100-year	212	100-year Loss:	\$22,605,480	High
		500-year	1,230	500-year	212			
Geological	High Landslide Susceptibility Areas	Class A:	256	Class A:	62	Class A:	52442928.17	Moderate
		Class B:	186	Class B:	42	Class B:	\$30,403,393	
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 losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Winter Weather	Severe Winter 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.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	69	Wildfire:	17	Wildfire:	\$76,136,926	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber-attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	<p>Port Newark is in Essex County (3rd largest port in the U.S.)</p> <p>Major highways/rail</p> <p>Pipelines</p> <p>10 NPL Sites including one in West Orange</p>	<p>Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.</p>	<p>The degree of damages to a building depends on the scale of the incident.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Utility Interruption	<p>Disruption of power or water supply caused by accident, sabotage, natural hazards, or equipment failure.</p>	<p>The degree of impact to the population depends on the scale of the incident.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Terrorism	<p>Terrorist Attack</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident.</p>	<p>Low</p>
Transportation Failure	<p>One accident on any of the following: Roadway/vehicular, Aviation, Rail</p>	<p>The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.</p>	<p>The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.</p>	<p>Low</p>



CRITICAL FACILITIES

The table below identifies critical facilities and lifelines located in the 1-percent and 0.2-percent annual chance floodplains and presents a mitigation action, if appropriate.

Table 9.23-12. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Orange Reservoir Dam	Dam	x	x	2020-W ORANGE-008
Orange Water Pumping Station-Well 6	Potable Well	x	x	2020-W ORANGE-006
Solomon Schechter Day School	School	x	x	2020-W ORANGE-009

ADDITIONAL IDENTIFIED VULNERABILITIES

According to the preliminary 2014 FEMA Flood Insurance Study (FIS), the Township has been affected by flooding in most of the low-lying areas located along the numerous open stream courses within its boundaries. Several other areas are also affected by flooding due to poor drainage. In 2010, the Township of West Orange passed 2274-10 An Ordinance Amending and Supplementing Chapter 25 Section 28 of the General Ordinances of the Town of West Orange, Entitled “Steep Slope and Natural Features Ordinance” which amended the steep slope ordinance by placing additional restrictions of State open waters, wetlands, wetland transition areas, flood hazard areas, floodways, and riparian zones. This amendment was warranted to prevent flooding, protect water quality, and preserve wildlife and aquatic habitat (FEMA FIS 2014).

The Township of West Orange has identified the following vulnerabilities within their community:

- Although the Liberty Middle School was identified by the New Jersey Forest Fire Service (NJFFS) as a facility in a high Wildfire Fuel Hazard area, the Township confirmed adequate hydrant service to the facility, as well as a 75-foot buffer zone between the school and woodlands.
- A major flood area exists along the East Fork of the East Branch Rahway River in West Orange, east of Valley Road between Freeman Street and Kingsley Street. The flooding problem there, which is due to inadequate channel capacity, has been studied by the USACE (USACE 1973). The upper portions of this stream are steeply sloped but as of the publication of the 2014 countywide FIS report, requests have been made to the USACE and NJDEP to assess whether there is flood storage potential at golf courses and other open spaces as a part of the larger study underway to study flood mitigation alternatives in the Rahway River Basin (FEMA FIS 2014).
- North Branch Wigwam Brook has had serious flooding problems in the vicinity of Harrison and Mississippi Avenues, and along most downstream parts of the improved channel. This is due to excessive velocity and lack of channel capacity, notably at Ashwood Terrace, Whittelsey Avenue, Watson Avenue, and Washington Avenue. South Branch Wigwam Brook has had serious flooding reported in the vicinity of Watchung Avenue, Lakeside Avenue, Standish Avenue, and Ashland Avenue (FEMA FIS 2014).
- West Branch Rahway River has had flooding problems along its entire length from Northfield Avenue to Lake Vincent, although parts of this river flow through undeveloped or country club areas (FEMA FIS 2014).
- An area on the western boundary of the Township of West Orange known as the Merklin District is subject to frequent flooding due to inadequate pipe sewers and insufficient capacity of the existing storm water pumping station. The area flooded is centered between Hunterdon and Morris Roads and Westover and Tappan Terraces. The Mayfair District centered on Mayfair Drive in the north central part of the township is one such location plagued by flooding related to drainage issues. In this location flooding is caused by an inadequate storm water ejector system (Elson T. Killman Associates, Inc. 1972). The Township of West Orange has been moving





forward with plans to undertake storm sewer improvements and in 2011 awarded construction contracts to begin the improvements to help alleviate flooding projects on several streets including Nastro Road, Midro Way, Mayfair Drive and Rosemont Terrace and Rosemont Drive. This project has been financed by a grant from the NJDEP and a loan from the New Jersey Environmental Infrastructure Trust (FEMA FIS 2014).

- 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 West Paterson (USACE 2014). In the Township of West Orange, flooding has occurred between Nicholas Avenue and Kenz Terrace along the Peckman River (FEMA FIS 2014). 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).

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of West Orange 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 Orange has significant exposure. A map of the Township of West Orange hazard area extent and location is provided in Figures 9.23-1 and 9.23-2. This map also displays the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties 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 4 of the plan. 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex 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 for the Township of West Orange. During the review of the calculated hazard ranking, the Township adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Township of West Orange has reviewed the Essex County hazard ranking table, as well as its individual calculated results, to reflect the relative risk of the hazards of concern to the community, as reported in Table 9.23-13.



During the review of the hazard ranking, the Township indicated the following:

- The Township changed to hazard ranking for flood to high due to the flooding experienced in multiple locations in the township.
- The Township changed the hazard ranking for wildfire, disease outbreak, and hazardous substances from low to medium to reflect that there were no changes to the hazard risk from the 2015 HMP.
- The Township changed the hazard ranking for transportation failure from low to medium because state road closures, which have become more frequent, dramatically impact the Township’s major arteries.

Table 9.23-13. Township of West Orange Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Medium	Medium	Medium	High	Low	Medium

9.23.7 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 9.23-14. 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 #
West Orange-1	To ensure continuity of operations, obtain backup power for critical facilities.	Various	In progress	Yes	2020-W ORANGE-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 #
<p>The following locations have been updated at this time:</p> <ol style="list-style-type: none"> 1. West Orange Township Hall generator. (In Process) 2. West Orange Fire Station #2 generator project. (In Process) 3. West Orange Fire Station #3 generator project. (In Process) 4. West Orange High School generator project. (Partially complete) 5. West Orange wastewater sewage pump stations (No progress) 6. West Orange public library (Future need – moving locations) 7. West Orange Police Department (No progress) 8. West Orange Roosevelt Middle School (No progress) 9. West Orange Fire Headquarters (Complete) 10. West Orange Fire Station #4 (Complete) 11. West Orange Alex Caprio Animal Control Shelter. (No progress) 				
<p>West Orange-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.</p> <p>Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option (in progress).</p> <p>Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability. Specifically identified are properties in the following areas:</p> <ul style="list-style-type: none"> • East Branch of Rahway River • West Branch of Rahway River • North Branch Wigwam Brook • Peckman River area 	FPA	No progress	Yes	2020-W ORANGE-002
<p>West Orange-3 Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what residents can do in the way of mitigation and preparedness, including flood insurance. This program will include:</p> <ul style="list-style-type: none"> • 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 Town/Village 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 in the annual newsletter. • Provide public education on eliminating inflow from sump pump and roof leader discharges. 	FPA	In progress.	Yes	2020-W ORANGE-003
<p>West Orange-4 Support participation in the NFIP Community Rating System (CRS) program by attending CRS workshop(s) if offered within the county. Join the CRS program if adequate resources to support long term participation can be dedicated. See following related Community Assistance Visit (CAV) initiative.</p>	FPA	No progress. Discontinue due to other priorities.	-	-



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 #
West Orange-5 Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. This is a part of the process of joining CRS (above initiative).	FPA	No progress. Discontinue due to other priorities.	-	-
West Orange-6 Make structural improvements to sewer system Township wide to include identifying properties susceptible to sewage backups during flooding events.	Engineer	In progress. Isolated causes of backups, placed homes on ejector systems, and installed backflow preventors.	Yes	2020-W ORANGE-004
West Orange-7 Enhance/expand municipal tree maintenance and identification of preferred species planting program in conjunction with utility companies and PSE&G.	PSEG	Discontinue. Ongoing PSEG tree maintenance program.	-	-

The Township did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of West Orange participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of West Orange participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.23-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of West Orange 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 (4) FEMA mitigation action categories and the six (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 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.23-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.23-18 summarizes the actions by type across hazards of concern.



Table 9.23-15. 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-W ORANGE -001	Backup power for continuity of operations of critical facilities	The 2015 HMP included planning for backup power at 11 critical facilities. Although the West Orange Fire Headquarters and West Orange Fire Station #4 received backup power since the 2015 HMP, nine critical facilities still require generators.	Complete the generator projects in the following locations: a. Town Hall (In Progress) b. Fire Station #2. (In Progress) c. Fire Station #3 (In Progress) d. High School (Partially complete) e. Wastewater sewage pump stations (No progress) f. Police Dept (No progress) g. Roosevelt Middle School (No progress) h. Alex Caprio Animal Control Shelter. (No progress) i. Public library (Future – moving)	Existing	Utility Interruption	1.2, 2.1, 4.1, 6.1, 6.2	<u>Township OEM</u>	HMGP, PDM, Municipal Budget	High	High	Long	High	SIP	PP, ES
2020-W ORANGE -002	Mitigation of vulnerable structures via retrofit or acquisition/relocation to protect structures from future damage, with repetitive loss properties as a priority	FEMA reports 11 repetitive loss properties in the Township.	Phase 1: Identify properties that flood and determine most cost-effective mitigation option (in progress). Phase 2: Work with property owners to implement selected action with available funding from FEMA and local match for properties in the following areas: • East Branch of Rahway River • West Branch of Rahway River • North Branch Wigwam Brook • Peckman River	Existing	Flood	1.2, 2.2, 4.2	<u>Municipal OEM, FPA</u>	HMGP, PDM, Municipal Budget	High	High	Long	High	SIP	PP, SP



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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-W ORANGE -003	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and actions residents can do for preparedness and mitigation, including flood insurance.	West Orange strives to provide residents with actions to take when faced with hazards.	Provide general natural hazard risk, preparedness, mitigation, and NFIP information on the website, in newsletters, and mailings, through social media channels, and email blasts. Post flyers at Town Hall. Distribute info. at civic meetings. Administer public surveys. Post available natural hazard risk mapping. Enhance public outreach to residents in NFIP floodplain areas to inform of annual grant opportunities. Provide public education on eliminating inflow from sump pump and roof leader discharges.	Existing	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood, Geological hazards, Severe Weather, Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure	1.2, 2.2, 3.1, 3.3	<u>Township Administrator, Public Information Officer</u>	Municipal budget	Medium	Low	Short	High	EAP	PI
2020-W ORANGE -004	Inventory of impacted properties and structural improvements to the sanitary sewer system.	Properties are susceptible to sewage backups during flooding events. Previously isolated causes of backups, placed homes on ejector systems, and installed backflow preventors.	Make structural improvements to sewer system Township-wide, including identifying properties susceptible to sewage backups during flooding events and providing a menu of BMPs to implement.	Existing	Flood - Sanitary Sewer	1.2, 3.1	<u>Township Engineering</u>	Municipal Budget	High	Low	Short	High	SIP, EAP	PR, PI
2020-W ORANGE -005	Master Plan and HMP Integration	Master Plan does not integrate Essex County HMP	Include discussion of Essex County HMP in next update.	New	Coastal Storm, Drought, Earthquake, Extreme Temperature, Flood,	4.1, 5.4	<u>Planning Board</u>	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, 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
					Geological hazards, Severe Weather, Winter Weather, Wildfire, Civil Disorder, Cyber Attack, Disease Outbreak, Economic Collapse, Hazardous Substances, Utility Interruption, Terrorism, Transportation Failure									
2020-W ORANGE -006	Orange Water Pumping Station-Well 6	Orange Water Pumping Station-Well 6 is in the floodplain.	Determine extent of flooding expected to the well and plan mitigation.	New	Flood	1.2, 2.1	Township Engineering	Municipal Budget	High	Medium	Short	High	SIP	PR, PP
2020-W ORANGE -007	Orange Reservoir Dam	Orange Reservoir Dam in the floodplain.	Update EOP to include review of EAPs from the City of Orange.	New	Flood	1.2, 2.1	Township Engineering	Municipal Budget	Medium	Low	Short	Medium	EAP	PR, PP
2020-W ORANGE -008	Solomon Schechter Day School	Solomon Schechter Day School in the floodplain.	Discuss with Solomon Schechter Day School that Solomon Schechter Day School is in the floodplain.	New	Flood	1.2, 2.1	Township Engineering	Municipal Budget	Medium	Low	Short	Medium	EAP	PR, PP, PI

Notes:

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- EAP Emergency Action Plan
- EOP Emergency Operations Plan
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable

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.





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 9.23-16. 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-W ORANGE-001	Backup power for continuity of operations of critical facilities	1	0	1	1	1	1	0	1	1	1	1	1	1	1	12	High
2020-W ORANGE-002	Mitigation of vulnerable structures via retrofit or acquisition/ relocation to protect structures from future damage, with repetitive loss properties as a priority	1	1	1	1	0	1	0	1	1	1	1	0	1	1	11	High
2020-W ORANGE-003	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and actions residents can do for preparedness and mitigation, including flood insurance.	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020-W ORANGE-004	Inventory of impacted properties and structural improvements to the sanitary sewer system.	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-W ORANGE-005	Master Plan and HMP Integration	0	1	0	1	0	1	1	1	0	0	1	1	0	1	8	Medium
2020-W ORANGE-006	Orange Water Pumping Station-Well 6	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-W ORANGE-007	Orange Reservoir Dam	1	1	1	1	0	0	1	1	1	0	0	1	0	1	9	Medium
2020-W ORANGE-008	Solomon Schechter Day School	0	1	1	1	0	0	1	1	1	0	0	1	0	1	8	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).





Table 9.23-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilience	Community Capacity Building
Coastal Erosion / Sea Level Rise	-	-	2020-W ORANGE-003	-	-	-	-	-
Coastal Storm	-	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003
Drought	-	-	2020-W ORANGE-003	-	-	-	-	-
Earthquake	-	-	2020-W ORANGE-003	-	-	-	-	-
Extreme Temperature	-	-	2020-W ORANGE-003	-	-	-	-	-
Flood	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008, 009	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008	2020-W ORANGE-002, 006, 007	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008	2020-W ORANGE-002, 003, 004, 005, 006, 007, 008
Geological hazards	-	-	2020-W ORANGE-003	-	-	-	-	-
Severe Weather	-	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002
Severe Winter Weather	-	2020-W ORANGE-002, 003	2020-W ORANGE-002, 003	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002	2020-W ORANGE-002
Wildfire	-	-	2020-W ORANGE-003	-	-	-	-	-
Civil Disorder	-	-	2020-W ORANGE-003	-	-	-	-	-
Cyber Attack	-	-	2020-W ORANGE-003	-	-	-	-	-
Disease Outbreak	-	-	2020-W ORANGE-003	-	-	-	-	-
Economic Collapse (new)	-	-	2020-W ORANGE-003	-	-	-	-	-
Hazardous Substances	-	-	2020-W ORANGE-003	-	-	-	-	-
Utility Interruption	2020-W ORANGE-001	2020-W ORANGE-001	2020-W ORANGE-001, 003	2020-W ORANGE-001	2020-W ORANGE-001	2020-W ORANGE-001	2020-W ORANGE-001	2020-W ORANGE-001
Terrorism	-	-	2020-W ORANGE-003	-	-	-	-	-
Transportation Failure	-	-	2020-W ORANGE-003	-	-	-	-	-

Note: Section 6 (Mitigation Strategy) provides an explanation of the mitigation categories.



9.23.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of West Orange 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.23-18. Contributors to the Annex

Entity	Title	Method of Participation
Daniel Shelley	OEM Coordinator	Primary POC, attended meeting 1, reviewed notes, provided response to questions
Paul Wannemacher	Deputy OEM Coordinator	Attended meeting 1, reviewed notes
Leonard Lepore	DPW Director/Municipal Engineer	Attended meeting 1, reviewed notes, hazard discussion, provided response to questions, addressed mitigation actions
Nick Allegrino	OEM Coordinator	Hazard discussion, reviewed notes
Anthony Vecchio	Fire Chief	Hazard discussion, reviewed notes

Figure 9.23-1. Township of West Orange Hazard Area Extent and Location Map

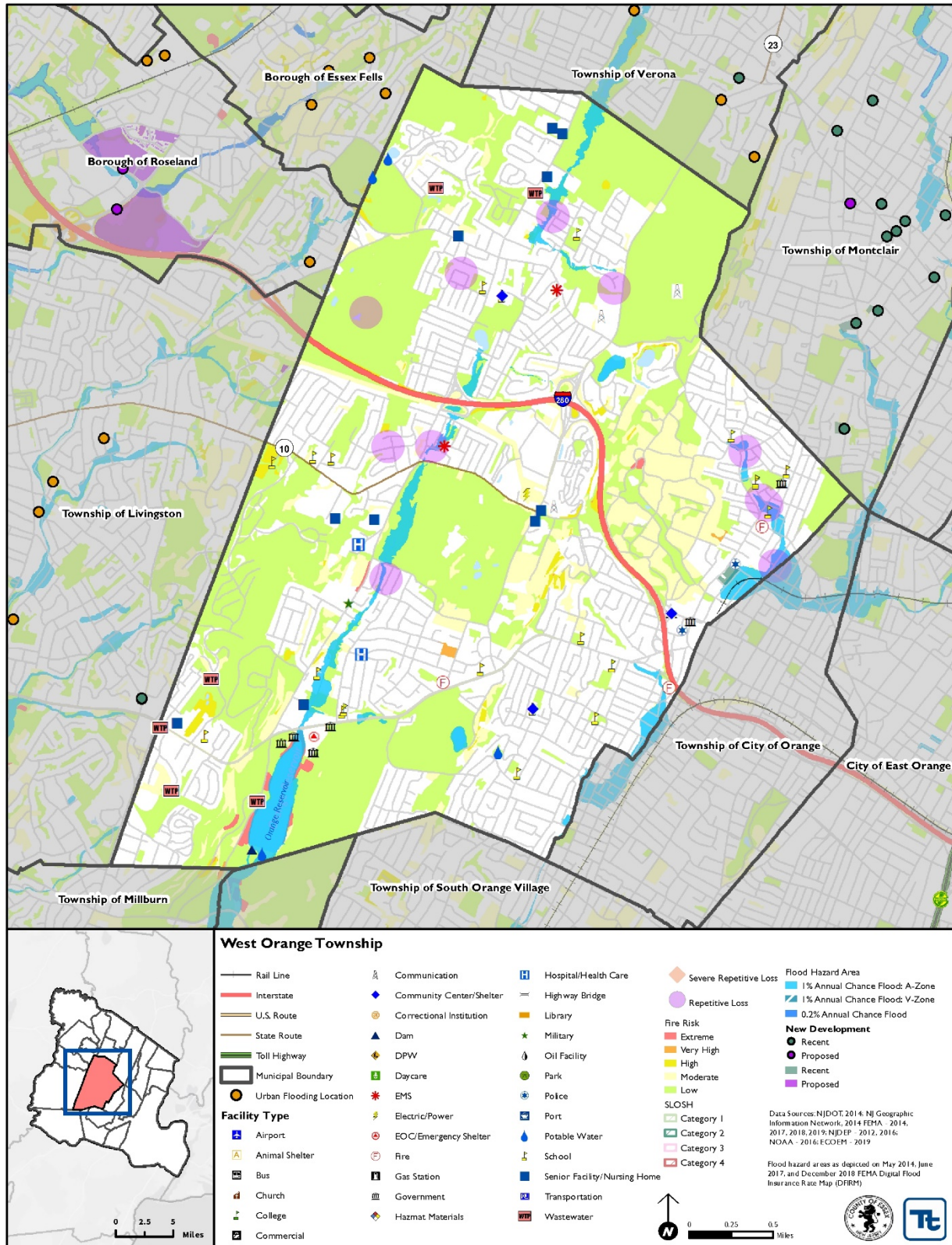
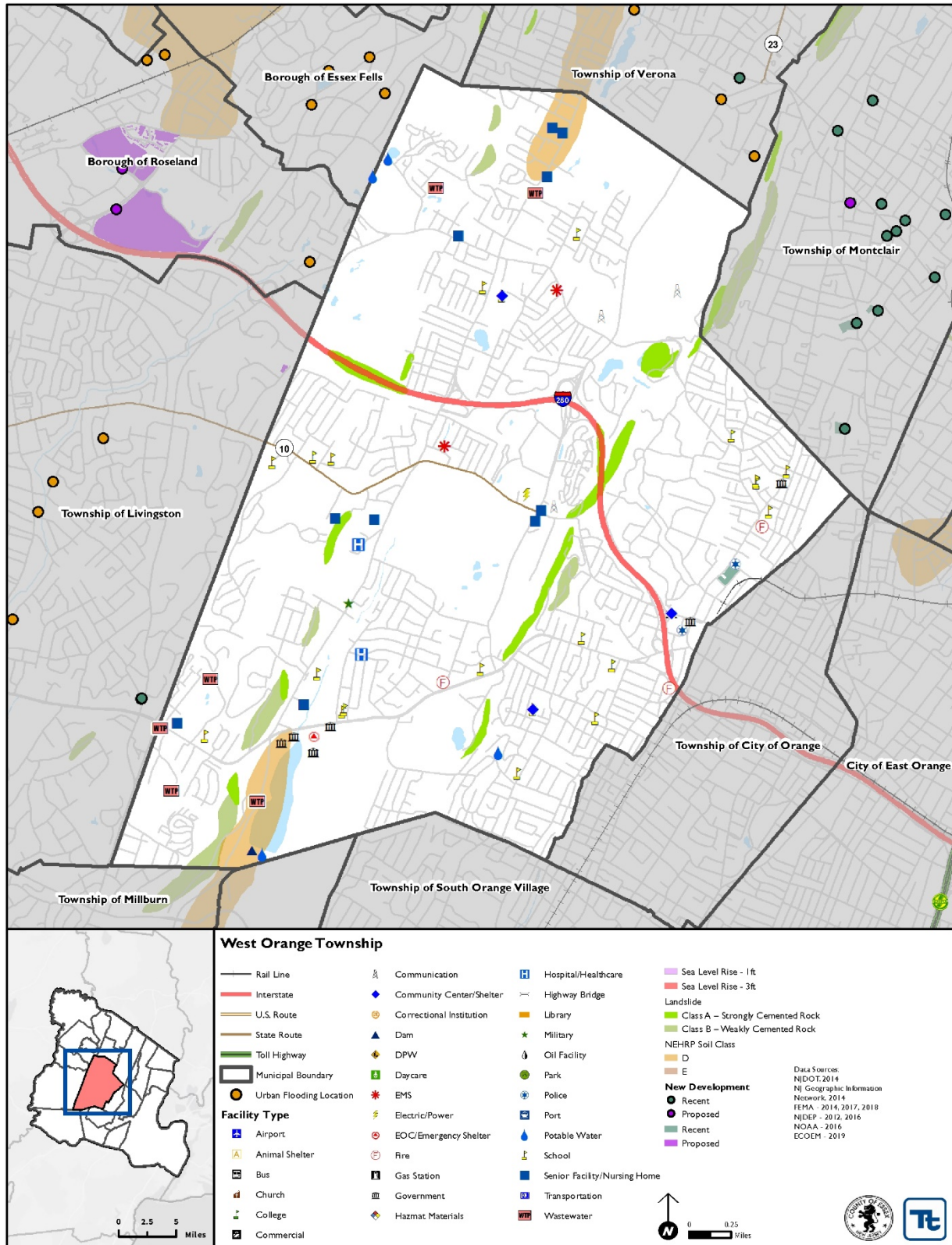


Figure 9.23-2. Township of West Orange Hazard Area Extent and Location Map 2





Name of Jurisdiction: West Orange
 Name and Title Completing Worksheet: Daniel Shelley, OEM Coordinator

Action Worksheet			
Project Name:	Mitigation of vulnerable structures via retrofit or acquisition/ relocation to protect structures from future damage, with repetitive loss properties as a priority		
Project Number:	2020-W ORANGE-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Property damage, road closures, and flooded basements during storms.		
Action or Project Intended for Implementation			
Description of the Solution:	Identify appropriate candidates, and work with property owners to implement selected action.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	100-year	Estimated Benefits (losses avoided):	Flooding avoided
Useful Life:	n/a	Goals Met:	1.2, 2.2
Estimated Cost:	Medium	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	Medium	Potential Funding Sources:	HMGP, PDM. Municipal Budget
Responsible Organization:	Municipal OEM	Local Planning Mechanisms to be Used in Implementation if any:	HMP
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Provide stormwater retention	High	Not feasible
	Increase stream capacity	High	Not feasible
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: West Orange
 Name and Title Completing Worksheet: Daniel Shelley, OEM Coordinator

Action Worksheet		
Project Name:	Mitigation of vulnerable structures via retrofit or acquisition/ relocation to protect structures from future damage, with repetitive loss properties as a priority	
Project Number:	2020-W ORANGE-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Will protect homeowners
Property Protection	1	Will protect structure
Cost-Effectiveness	1	Cost share with federal grants, a benefit cost analysis must be completed
Technical	1	This initiative is technically feasible
Political	0	Neutral
Legal	1	This is a legal initiative
Fiscal	0	Funding sources are needed
Environmental	1	Supports open space
Social	1	Community supports
Administrative	1	Administratively the Township can support
Multi-Hazard	1	Several hazards will be mitigated for structure
Timeline	0	Dependent upon funding
Agency Champion	1	OEM will spearhead this initiative
Other Community Objectives	1	Supports community objectives to protect life and property
Total	11	
Priority (High/Med/Low)	High	



Name of Jurisdiction: West Orange
 Name and Title Completing Worksheet: Daniel Shelley, OEM Coordinator

Action Worksheet			
Project Name:	Inventory of impacted properties and structural improvements to the sanitary sewer system.		
Project Number:	2020-W ORANGE-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Flooding of roadways and back up of storm water and sewer system		
Action or Project Intended for Implementation			
Description of the Solution:	Make structural improvements to sewer system Township wide to include identifying properties susceptible to sewage backups during flooding events.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	High	Estimated Benefits (losses avoided):	Flood
Useful Life:	TBD	Goals Met:	1.2, 2.1, 2.2
Estimated Cost:	High (\$1.6M)	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	Short
Estimated Time Required for Project Implementation:	Short	Potential Funding Sources:	HMA Grants, State and County Grants, Municipal Budget
Responsible Organization:	Township Engineer, FPA, Township Administrator	Local Planning Mechanisms to be Used in Implementation if any:	HMP
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Structural Improvements	High	Cost effective choice to help with future loss.
	Install new Separate Storm Sewer System	High	Not cost effective or environmentally-friendly.
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name of Jurisdiction: West Orange
 Name and Title Completing Worksheet: Daniel Shelley, OEM Coordinator

Action Worksheet		
Project Name:	Inventory of impacted properties and structural improvements to the sanitary sewer system.	
Project Number:	2020-W ORANGE-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Can support life safety due to damage to homes and hazards
Property Protection	1	Will protect property
Cost-Effectiveness	1	Benefit cost analysis must be completed with application
Technical	1	Project requires technical expertise
Political	1	Township government supports
Legal	1	Legal authority
Fiscal	0	Budget must be identified
Environmental	1	Supports environment
Social	1	Community support
Administrative	1	Township is capable of supporting
Multi-Hazard	1	Addresses several hazards
Timeline	1	Dependent upon funding and this project is a priority
Agency Champion	1	Township Administrator, FPA and engineer support this project
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



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
C	City
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
CEDS	Comprehensive Economic Development Strategy
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information 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
NPL	National Priorities List
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
PC	Planning Committee



PCII	Protected Critical Infrastructure Information
PD	Police Department
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
SWCD	Soil and Water Conservation District
SWMP	Storm Water Management Plan
SWOO	Strengths, Weaknesses, Obstacles and Opportunities
T	Township or Town
TBD	To Be Determined
TNJ	Together North Jersey
TOD	Transit Oriented Development
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



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