



9.37 TOWNSHIP OF ROXBURY

This section presents the jurisdictional annex for the Township of Roxbury. The annex includes a general overview of the Township of Roxbury; an assessment of the Township of Roxbury'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.

9.37.1 Hazard Mitigation Planning Team

The following individuals are the Township of Roxbury's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.37-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Michael Kobylarz, P.E., Township Engineer 1715 Route 46, Ledgewood, NJ 07852 973-448-2017 kobylarzm@roxburynj.us	Melanie Michetti, P.E., Sr. Asst. to Engineer 1715 Route 46, Ledgewood, NJ 07852 973-448-2074 michettim@roxburynj.us
NFIP Floodplain Administrator	
Michael Kobylarz, P.E., Township Engineer 1715 Route 46, Ledgewood, NJ 07852 973-448-2017 kobylarzm@roxburynj.us	

9.37.2 Jurisdiction Profile

The Township of Roxbury comprises 21.93 square miles and is located in the western portion of Morris County and the New Jersey Highlands Region. The Township is linked to the County and the region via a highway network that includes Interstate 80 and State Routes 10, 46, and 206. The Township shares its borders with nine municipalities, all but one of which are located in Morris County. The Borough of Hopatcong (Sussex County) is to the north of Roxbury. The communities of Netcong, Mount Olive, Chester Township, Randolph, Mine Hill, Wharton, Jefferson and Mount Arlington all surround Roxbury Township. The Township of Roxbury contains several unincorporated communities and neighborhoods: Kenvil, Succasunna, Berkshire Valley, Landing, Ledgewood and Port Morris. Major bodies of water in the Township include the Lamington River, Drakes Brook, Succasunna Brook, Rockaway River, a portion of Lake Hopatcong, Horseshoe Lake, Triple Lakes, and Chesler Lake.

According to the U.S. Census, the 2010 population for the Township of Roxbury was 23,324. The estimated 2017 population was 23,458, a 0.6 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 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.

9.37.3 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 9.37-2 summarizes recent and expected future development trends, including major



residential/commercial development and major infrastructure development. Figure 9.37-1 and 9.37-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.37-2. 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	2	11	10	6	1
Multi-Family	0	0	0	0	243
Other (commercial, mixed-use, etc.)	0	0	0	0	0
Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
KPM Realty	Commercial	100,000 SF warehouse/office	Block 9601, Lot 1	None	Complete
Roxbury Enterprises	Commercial	11,500 SF commercial/retail	Block 5002, Lot 3	NEHRP: D; Karst Hazard	Complete
Dellamo	Residential	35 apts.	Block 6101, Lot 4	Flood: 1% Chance; NEHRP: D; Karst Hazard	Complete
Renaissance Village Assoc.	Residential	35 apts.	Block 6201, Lot 5.01	Flood: 1% Chance; NEHRP: D; Karst Hazard	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Ledgewood Mall redevelopment	Commercial	multiple structures	B: 6304 L: 1		In progress
Ralzone Development	Residential	6 single family homes	Block 4305, Lot 12	NEHRP: D	95% complete
Roxwood Assoc., LLC	Residential	230 apts.	Block 9302, Lot 1	None	50% complete
Villages @ Roxbury	Residential	161 single family homes	Block 11201, Lots 1, 3, & 13	NEHRP: D	On Hold

* Only location-specific hazard zones or vulnerabilities identified.

9.37.4 Capability Assessment

The Township of Roxbury 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 planning, legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.



For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas that mitigation is currently integrated are summarized below. The Township of Roxbury 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 Roxbury and where hazard mitigation has been integrated.

Table 9.37-3. Planning, Legal and Regulatory Capabilities

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	State, Local, Building Code Official	Yes	No	-
Comment: The Township follows the State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.), Chapter IX of Revised General Ordinance					
Zoning Code	Yes	Local, Zoning Board	Yes	Yes	-
Comment: Chapter 13 (Land Development) – Section 7 outlines the zoning regulations for the Township. The provisions of this section must be held to be minimum requirements adopted for the promotion of public health, safety, morals, and general welfare. Any development in the Township should be laid out to avoid adversely affecting ground water and aquifer recharge; to reduce cut and fill; to avoid unnecessary impervious cover; to prevent flooding; to provide adequate access to lots and sites; to protect scenic views; and to mitigate adverse effects of shadow, noise, odor, traffic, drainage, and utilities on neighboring properties. All applications for zoning permits must provide documentation of compliance with all applicable requirements of local, County, State and Federal governmental ordinances, statutes and regulations, pertaining to the proposed use, structure and/or building, including without limitation the Highlands Act and its implementing regulations.					
Subdivisions	Yes	Local	Yes	Yes	-
Comment: Chapter XIII of Revised General Ordinance, Article III, Section 13-3.1 – subdivision plat shall be designed to encourage good planning concepts and quality development patterns within the municipality and conform to the Master Plan and Official Map					
Stormwater Management	Yes	Local, Engineer	Yes	Yes	-
Comment: Chapter XIII of Revised General Ordinances, Section 13-8.4 <ul style="list-style-type: none">Municipal Separate Storm Sewer System (MS4): Chapter III of Revised General Ordinances, Section 3-25, Chapter XXII of Revised General Ordinances, Section 22-7.10The Planning and Zoning Boards review projects to ensure compliance with stormwater regulations before issuing preliminary or final subdivision or site plan approvals. All new residential developments or redevelopments that are subject to the Residential Site Improvement Standards for stormwater management are in compliance with those standards. All new non-residential projects that are not subject to the Residential Site Improvement Standards are required to be in compliance with the Township’s Stormwater Management section of the Land Development Ordinance.					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of	Yes	-	-



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
		Consumer Affairs			
Comment: N.J.A.C. 13:45A-29.1					
Growth Management	No	-	-	-	-
Comment:					
Site Plan Review	Yes	Local, Zoning Board	Yes	-	-
Comment: Chapter XIII of Revised General Ordinance, Article III, Section 13-7.824; the Planning Board and Zoning Board of Adjustment have the power to grant waivers from a design standard requirements for site plan approvals. The Planning Board conducts the site plan reviews and approves or denies the plan.					
Environmental Protection	Yes	Federal, State and Local	Yes	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State, Local, Construction Code Official	Yes	Yes	-
Comment: Chapter XIII of Revised General Ordinance, Article III, Section 13-7.823 <ul style="list-style-type: none"> NFIP: Freeboard, Chapter XIII of Revised General Ordinance, Article III, Section 13-7.824 States that no development can take place or no structure can be built or substantially improved with any flood hazard area unless and until a development plan is submitted to the Planning Board for approval. Lands in the floodplain shall be preserved to the maximum extent consistent with the reasonable utilization of land. 					
Wellhead Protection	Yes	Local	No	No	-
Comment: Chapter 13 (Land Development) Section 7 (Protection of Critical Aquifer Recharge Areas) – these areas include those areas identified by the USGS in its "Alamontong Wellhead Protection Study" as areas of 12 years or less travel time of recharge to actual or potential public water supply wellheads. Category 1 Areas are those identified in the USGS Study as having a recharge travel time to such wellheads of 5 years or less. Category 2 Areas include all other Critical Aquifer Recharge Areas with recharge-to-wellhead travel time of greater than 5 years but not greater than 12 years.					
Emergency Management	Yes	Local	No	-	-
Comment:					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local, Planning Board	Yes	Yes	-



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years ? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Comment: 7-11-2000, 2017 Periodic Reexamination Report of the Master Plan and Development Regulations of the Township of Roxbury; adopted August 2, 2017; Planning Board is responsible for maintaining and updating. <ul style="list-style-type: none">One of the goals of the plan is to implement the requirements of Highland Plan Conformance for the Preservation Area portion of the Township. Land use restrictions in the Preservation Area are governed by the Highlands Act and rezoning at the municipal level for these areas is not necessary. The plan also references the stormwater ordinance and plan.In the 2009 Land Use Element Update, several of the goals pertain to alleviating flooding from storm drainage and discouraging development in the flood hazard areas. The Land Use Plan also recognizes the adoption of the Highlands Master Plan and the requirement of conformance of the Township's land located in the Preservation Area (over 30% of the Township is located in the Preservation Area). Lastly, the Land Use Plan Element is consistent with the Morris County Future Land Use Plan, and the Solid Waste Management Plan utilizing environmental considerations in land use decisions and promoting clustering to preserve environmentally sensitive lands are consistent with the municipal plans.					
Capital Improvement Plan	Yes	Local, Manager	No	-	-
Comment: Capital Improvement is included in the Township's annual budget. The budget includes line items for equipment for snow removal, fire equipment, and money put aside for capital improvement projects.					
Disaster Debris Management Plan	No	-	-	-	-
Comment:					
Floodplain or Watershed Plan	Yes	Federal, State, Local	Yes	-	-
Comment:					
Stormwater Management Plan	Yes	Local, Planning Board	Yes	-	-
Comment: Township of Roxbury Municipal Stormwater Management Plan, 12/2006; the Township has stormwater management information available on their website that informs the public what stormwater is and how to conserve water.					
Stormwater Pollution Prevention Plan	Yes	Local, State	Yes	No	No
Comment: Township of Roxbury Stormwater Pollution Prevention Plan, revised February 28, 2020 – includes information on the Township's NJPDES permits. The Plan outlines the responsibilities the Township has with regards to stormwater pollution prevention. This includes public outreach and education and maintenance programs to reduce pollution and runoff.					
Urban Water Management Plan	No	-	-	-	-
Comment:					
Habitat Conservation Plan	No	-	-	-	-
Comment:					
Economic Development Plan	Yes	Local	No	-	-
Comment:					
Shoreline Management Plan	No	-	-	-	-
Comment:					
Community Wildfire Protection Plan	No	-	-	-	-
Comment:					
Community Forest Management Plan	Yes	Local	No	No	No
Comment: 2016-2020 Community Forestry Management Plan. The purpose of the plan is to improve the quality of life in the Township by maximizing the environmental, social, and economic benefits of trees to the community while minimizing the associated costs and liabilities.					
Transportation Plan	No	-	-	-	-
Comment:					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Agriculture Plan	No	-	-	-	-
Comment:					
Climate Action Plan	No	-	-	-	-
Comment:					
Tourism Plan	No	-	-	-	-
Comment:					
Business Development Plan	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local, OEM, Engineer	Yes	-	-
Comment: Municipal EOP and includes post-disaster recovery plan and a continuity of operations plan					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local, OEM, Engineer	No	-	-
Comment: Municipal EOP					
Continuity of Operations Plan	Yes	Local	No	-	-
Comment:					
Public Health Plan	No	-	-	-	-
Comment:					
Other	Yes	Local, OEM, Engineer	No	-	-
Comment:					
<ul style="list-style-type: none"> Emergency Response Plan, Municipal EOP Strategic Recovery Planning Report, Municipal EOP 					

Table 9.37-4. Development and Permitting Capabilities

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes – Planning and Zoning
Does your jurisdiction have the ability to track permits by hazard area?	Yes



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 – Part of the Highlands work that the Township conducted, did a property-by-property

ADMINISTRATIVE AND TECHNICAL CAPABILITY

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

Table 9.37-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Roxbury Township Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	The Roxbury Environmental Commission (REC) is comprised of volunteer Roxbury residents, appointed by the Mayor. The commission advises the Mayor and Council, as well as Township officials, including the Planning and Zoning Boards regarding environmental issues and actions that can affect the inhabitants and natural resources of the community. The REC holds information meetings with the general public on various environmental topics including illicit connections and improper waste disposal.
Open Space Board / Committee	Yes	Open Space Advisory Committee
Economic Development Commission / Committee	Yes	Roxbury Township Economic Development Committee - serves as an ally for companies seeking a new location and those already operating in Roxbury. Their mission is to create a more vibrant and cultivated community by developing and providing data and information to assist businesses in their expansion in and/or relocation to Roxbury Township
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Morris County reverse 911 (RAVE), social media and municipal website
Maintenance program to reduce risk	Yes	Tree trimming through the DPW; rehabilitation of sanitary manholes and mains to decrease storm water infiltration; street sweeping; catch basin cleaning program
Mutual aid agreements	Yes	Surrounding municipalities
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning/Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Construction / Engineering
Planners or engineers with an understanding of natural hazards	Yes	Russell Stern, P.P.
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyor	No	-
Stormwater engineer	Yes	Planning Board Engineer
Personnel skilled or trained in GIS applications	Yes	Engineering Dept. staff



Staff/Personnel Resource	Available?	Department/Agency/Position
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM Director
Grant writers	Yes	Township staff
Resilience Officer	No	-
Watershed planner	No	-
Environmental specialist	No	-
Other	No	-

FISCAL CAPABILITY

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

Table 9.37-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

EDUCATION AND OUTREACH CAPABILITY

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

Table 9.37-7. 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? • If yes, briefly describe.	Yes – Township traffic alerts, emergency alerts, no parking alerts
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes – Municipal website, Facebook, Twitter, Reverse 911
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes – Municipal newsletter, tax bills can both be used to include hazard-related information



Criterion	Response
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes - Morris County reverse 911 (RAVE), social media and municipal website are all used to provide emergency notifications and other information to the Township

COMMUNITY CLASSIFICATIONS

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

Table 9.37-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	N/A	N/A
Public Protection (Fire ISO Protection Class)	Yes	04/4Y	April 2015
Storm Ready Certification	No	N/A	N/A
Firewise Community Classification	No	N/A	N/A
Sustainable Jersey	No	N/A	N/A

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 Morris County, Rutgers Climate Institute, NJ State Climatologist, and Morris Land Conservancy
- Is the administration 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 community? Yes, through aggressive open space purchases and landscaping requirements for ‘greening’ of development sites.

Table 9.37-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Dam Failure	Medium
Disease Outbreak	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood	Medium
Geological Hazards	Medium
Harmful Algal Bloom	Medium
Hazardous Substances	Medium
Infestation	Medium



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Severe Weather	Medium
Severe Winter Weather	Medium
Wildfire	Medium

Notes:

High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;

Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.37-10. 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)	Municipal Engineer
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 – part of the Township’s Land Development ordinance
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets the minimum
When was the most recent Community Assistance Visit or Community Assistance Contact?	According to data provided by FEMA, a CAV or CAC has not been conducted for the Township
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 – Outdated (~1980s) and show too many areas that are flood prone that really are not flood prone or questionable
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 - Continuing education and/or certification training on floodplain management
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, has considered joining
How many flood insurance policies are in force in your jurisdiction?*	59 Policies In-Force. \$17,264,500 Insurance In-Force. \$30,303 Premium In-Force.
How many total loss claims have been filed in your jurisdiction?*	32 total Claims. 0 claims still open. 14 claims closed without payment. \$89,403 total claim amount.
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 – No interest within Township

*According to FEMA statistics as of July 2019

**ADDITIONAL AREAS OF EXISTING INTEGRATION**

- The **Planning and Zoning Department** is responsible for administering and enforcing the Township's Zoning, Subdivision, and Site Plan Ordinances. It also assists the Planning Board and Zoning Board. The department is involved in long-term planning of the community through Master Plan amendments and Land Development Ordinance revisions. The staff is available to answer any questions and provide assistance to residents who wish to appear before either board or apply for a zoning permit. The department is staffed with a full time zoning officer who reviews all zoning permit applications to ensure compliance with the zoning ordinance.
- **Stormwater Management** – The Township's stormwater management program has an educational and outreach component that includes the following:
 - Information on the municipal website (<https://www.roxburynj.us/175/Stormwater-Management>)
 - Stormwater posters are on display at Town Hall.
 - The Clean Communities Coordinator distributes brochures at Lake Hopatcong Day and Suckasunny Day.
 - The Engineering Department sends reminders to some private property owners regarding the necessary maintenance of their on-site stormwater facilities.

9.37.5 Hazard Event History Specific to the Jurisdiction

Morris 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 Morris County and its jurisdictions. The Township of Roxbury's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Morris County. Table 9.37-11 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 9.37-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Morris County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-24, 2016	Severe Winter Storm and Snowstorm (DR-4264)	Yes	An impulse from the west coast traversed the midsection of the country, then developed into a low pressure system as it tracked across the Gulf states before intensifying along the Carolina coast into a major nor'easter, producing record snowfall in parts of New Jersey on January 23rd. It then moved out to sea after passing by the mid-Atlantic coast early on January 24th. Wind gusts up to 60 MPH produced blizzard conditions as visibilities dropped to one-quarter mile or less in spots. Snow began during the evening hours on the 22nd, then continued, heavy at times through the 23rd before ending	The Township had significant overtime for snow removal (\$141,714.65)



Date(s) of Event	Event Type (disaster declaration if applicable)	Morris County Designated?	Summary of Event	Summary of Local Damages and Losses
			early on the 24th. Snowfall totals included 30.0 inches in Long Valley, 29.0 inches in Madison, 26.0 inches in Budd Lake, 25.3 inches in Green Pond, 22.5 inches in Butler, 21.0 inches in Chatham, and 18.0 inches in Marcella. At one point during the storm, up to 270,000 customers were without power.	
March 6-7, 2018	Severe Winter Storm and Snow Storm (DR-4368)	Yes	<p>Precipitation gradually overspread the region during the overnight hours of March 6th to the 7th. 12 to 24 inches was observed across large parts of Morris County. The snow contained large amounts of liquid, making it heavy and wet. This resulted in downed trees, limbs, and wires, leading to numerous power outages across portions of New Jersey, especially where the heaviest snow was reported.</p> <p>Many customers were still without power from the previous storm when this storm struck.</p> <p>Governor Murphy estimated about 350,000 customers state-wide lost power as a result of this second storm. Governor Phil Murphy declared a state of emergency which went into effect at 8 PM Tuesday March 6th.</p>	The Township had significant overtime for snow removal and brush and debris removal (\$210,677.82)
March 21, 2018	Winter Storm	No	<p>Precipitation began as a wet, heavy snow during the evening hours on March 20th. After a lull during the overnight hours, a drier snow began falling, heavy at times, during the afternoon and evening hours on March 21st. Snowfall totals were lower in the eastern portions of the county where mixing took place. Some snowfall reports include: 12.0 inches in Netcong, Green Pond, and Mine Hill Township, 11.2 inches in Jefferson Township, 11.0 inches in Marcella, 10.5 inches in both Rockaway and Mine Hill Township, 10.0 inches in Succasunna, 9.5 inches in Butler, 9.3 inches in Denville, 9.2 inches in both Budd Lake and Washington Township, 8.8 inches in both Mount Arlington and Randolph Township, 8.4 inches in Morristown, 8.2 inches at Charlottesburg Reservoir, 8.0 inches in Dover, 7.5 inches in Parsippany, 7.0 inches at Boonton Reservoir, 7.0 inches in Millington, 6.5 inches in Pine Brook, 4.0 inches in Beach Glen, and 3.7 inches in Pleasantville.</p>	No damages reported



9.37.6 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. 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 9.37-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Dam Failure	Partial or complete failure of a dam There are 8 dams in the Township, according to NJDEP.	Population impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		The number of building impacted is dependent on the capacity of the dam, the extent of the dam failure inundation area and the severity of the failure.		Economic impacts include dam/building/infrastructure repairs; debris removal/disposal; utility impacts.		Low
Disease Outbreak	Disease Outbreaks which include: Mosquito-Borne Diseases, Tick-Borne Diseases, Campylobacteriosis, Influenza, Mumps, Ebola	Population impacted is dependent on the disease and severity of the outbreak; in some cases immuno-compromised persons are more vulnerable.		Structural impacts due to disease outbreak would be limited.		Economic losses can include County financial impacts to monitor/address outbreaks; lost wages or commercial interruptions; depends on the severity and type of disease outbreak. .		Low
Drought	Prolonged drought event - The County is serviced by water supplies who primarily get water from groundwater sources; some surface water sources.	Entire population exposed. Population on surface water supplies may be impacted first; water restrictions/contamination; increased wildfire risk.		Droughts are not expected to cause direct damage to buildings.		Losses include aesthetic, landscape/nursery/agricultural industry impacts.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period (MRP) Events evaluated NEHRP Soils D&E (soft soils that amplify ground shaking are present in the County)	NEHRP D&E:	12,948	NEHRP D&E:	5,670	100-year Loss:	\$0	High
		Liquefaction Class 4:	29	Liquefaction Class 4:	23	500-year Loss:	\$4,483,589	
						2,500-year Loss:	\$67,822,148	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,070	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:	1,267					
Flood	100- and 500-Year Mean Return Period Event	100-year	54	100-year	35	100-year Loss:	\$11,423,489	High
		500-year	62	500-year	292			
Geological	High Landslide Susceptibility Areas and Areas developed over carbonate rock	Class A:	7	Class A:	2	Class A:	1494182.219	Moderate
		Class B:	19	Class B:	9	Class B:	\$5,665,590	
		Carbonate Bedrock:	7,328	Carbonate Bedrock:	3,730	Carbonate Bedrock:	\$2,579,739,945	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Harmful Algal Bloom	Any body of water or area adjacent that is susceptible to harmful algal bloom.	Population in contact (e.g., swimming) or drinking water from surface water impacted can result in a range of health effects		General building stock impacts due to harmful algal bloom are not anticipated. Critical facilities (i.e., water treatment plants) could lead to plant closures.		Economic impacts range from recreational closure of impacted waterbodies; cost to sample/monitor/remediate.		Low
Hazardous Substance	Release of a hazardous substance from a fixed site.	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.		The degree of damages to a building depends on the scale of the incident.		The degree of damages depends on the scale of the incident.		Low
Infestation	Infestation including: Insects [e.g. Gypsy Moth, Mosquitoes, Spotted Lanternfly, Emerald Ash Borer], White-Tailed Deer, Rodents	Population impacted will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Physical impacts will be limited to indirect impacts from invasive species which affect crops and vegetation.		Economic impact will depend on the type and severity of infestation and may cause an increased risk for disease outbreak.		Low
Severe Weather	Severe Weather Event	Entire population exposed; The degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Annualized Loss:	\$67,664	High
						100 -Year Loss:	\$2,535,761	
						500-year Loss:	\$15,138,768	
Severe Winter Weather	Severe Winter Weather Event	All residents/commuters/visitors are exposed; socially-vulnerable populations may be at increased risk.		All buildings are exposed; the degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads/infrastructure can impact operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	16	Wildfire:	18	Wildfire:	\$16,264,735	Moderate



REPETITIVE FLOOD LOSSES

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

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

Source: FEMA BureauNet, 2019

Note: RL and SRL as of 04/26/2019; The number of SRL properties excludes RL properties and includes properties that have been verified only (SRL_Indicator = V).

CRITICAL FACILITIES

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

Table 9.37-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Lake Hopatcong Dam	Dam	X	X	2020-ROXBURY-005

Source:

*Identified lifeline

ADDITIONAL IDENTIFIED VULNERABILITIES

According to the preliminary 2010 FEMA Flood Insurance Study (FIS) for Morris County, the history of flooding in the Township of Roxbury indicates that flooding of various origins may be experienced at any time of the year. The more extensive floods in the Township have occurred during the late summer and early fall. The streams and rivers found in the Township contribute to the South Branch Raritan River basin, the Musconetcong River basin or the Lamington River basin (FEMA FIS 2010).

Additionally, the Township has identified the following vulnerable areas in the Township:

- Drakes Brook Stream Corridor (refer to 2020-ROXBURY-006)
- Succasunna Brook Stream Corridor (refer to 2020-ROXBURY-006)

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Roxbury 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 Roxbury has significant exposure. Refer to Figures 9.37-1 and 9.37-2.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.



As discussed in Section 4.3 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Morris County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community factoring in their capabilities to withstand impacts and bounce back after the event. The table below summarizes the hazard rankings of potential natural hazards for the Township of Roxbury. The Township of Roxbury has reviewed the Morris County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community. The Township modified the rankings for the following: dam failure (medium to low), disease outbreak (from high to medium), drought (from medium to low), extreme temperature (from medium to low), geological hazards (from medium to low), harmful algal bloom (from low to medium), hazardous substances (from high to medium), infestation (from medium to low), severe weather and severe winter weather (from high to medium), and wildfire (from medium to low). These adjustments are based on the history of occurrences and the Township's ability to bounce back after a hazard impacts the municipality.

Table 9.37-14. Township of Roxbury Hazard Ranking Input

Dam Failure	Disease Outbreak	Drought	Earthquake	Extreme Temperature	Flood
Low	Medium	Low	Medium	Low	Low

Geological Hazards	Harmful Algal Bloom	Hazardous Substances	Infestation	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	Medium	Low	Medium	Medium	Low

9.37.7 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 9.37-15. 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 #
TRX - 1	Upgrade of Culvert at Hillside Avenue and Route 46 (recent replacement not adequate).	Township Engineer	No Progress – the Township does not have jurisdiction over this project	X	2020-ROXBURY-001
TRX - 2	Comprehensive Emergency Planning revision for Roxbury Township.	OEM	No Progress	X	2020-ROXBURY-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 #
TRX - 3	Ledgewood Pond Dam Renovation.	Township Engineer	In Progress – will be completed in 2021	X	2020-ROXBURY-003
TRX - 4	Rehabilitation of sanitary manholes and mains to decrease storm water infiltration.	Township Engineer	Ongoing Capability – done every year or every other year		
TRX - 5	Detention basin upgrade located at Whitegate Road.	Township Engineer	No Progress	X	2020-ROXBURY-004
TRX - 6	Conduct an inundation study of the Lake Hopatcong Dam.	Town Engineer	No Progress	X	2020-ROXBURY-005
TRX - 7	Develop all-hazards public education and outreach program for hazard mitigation and preparedness.	County OEM	Ongoing Capability		
TRX - 8	Permanent emergency generator for Fire Co. No. 2 Annex	State OEM, Local	Complete		
TRX - 9	Provide solar panel/battery power to NJ State Highway Route 10 at all intersections	NJDOT	No Progress – the Township does not have jurisdiction over this project		
TRX - 10	Provide solar panel/battery power to US Highway Route 46 at all intersections	NJDOT	No Progress – the Township does not have jurisdiction over this project		
TRX - 11	Lamington River Maintenance and Sediment Removal	NJDEP	No Progress – the Township does not have jurisdiction over this project	X	2020-ROXBURY-006
TRX - 12	Drakes Brook Maintenance and Sediment Removal	NJDEP	No Progress – the Township does not have jurisdiction over this project	X	2020-ROXBURY-006
TRX - 13	Succasunna Brook Maintenance and Sediment Removal	NJDEP	No Progress – the Township does not have jurisdiction over this project	X	2020-ROXBURY-006
TRX - 14	When updating the master plan, the Township will review the countywide hazard mitigation plan.	Township	Ongoing Capability		

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Roxbury participated in a risk assessment workshop in November 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Roxbury participated in a mitigation action workshop in March 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Morris 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 C (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.



Table 9.37-16 summarizes the comprehensive-range of specific mitigation initiatives the Township of Roxbury would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 criteria were used to evaluate each action, including an evaluation of the benefits and costs. For each new mitigation action, a numeric rank was assigned (-1, 0, or 1) for each of the 14 evaluation criteria. The results of this evaluation, in addition to input from the jurisdiction, were then used to prioritize the mitigation initiatives as 'High', 'Medium', or 'Low.' Table 9.37-17 summarizes the evaluation of each mitigation initiative and the resulting priority, listed by Action Number.



Table 9.37-16. Proposed Hazard Mitigation Initiatives and Associated Priority

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-ROXBURY-001 (previous action)	Upgrade of Culvert at Hillside Avenue and Route 46	Problem: The culvert located at Hillside Avenue and Route 46 is inadequate in size. This leads to periodic roadway flooding Solution: Replace the culvert at Hillside Avenue and Route 46	Existing	Flood, Severe Weather	3	County Engineer, Township Engineer	EPA Clean Water Act Section 319; Township Budget	Allows drainage to flow through; reduces roadway flooding during heavy rain; allows road to remain open	\$500,000	Within 5 years	Medium	SIP	PP
2020-ROXBURY-002 (previous action)	Comprehensive Emergency Planning revision for Roxbury Township	Problem: The current CEMP for the Township is outdated and in need of updating. Solution: Work with Morris County OEM to update the Township's CEMP to meet county and state requirements.	N/A	All	3	Township OEM	Township Budget	Updated CEMP; provides roles and responsibilities of Township staff during disaster	\$25,000	Within 2 years	Medium	LPR	PR, ES
2020-ROXBURY-003 (previous action)	Ledgewood Pond Dam Renovation	Problem: The dam located at Ledgewood Pond does not meet NJDEP regulations. Additionally, the spillway needs to be stabilized. Solution: Reconstruct the Ledgewood Pond Dam to meet current NJDEP standards and stabilize the spillway. This will increase the integrity of the dam.	Existing	Dam Failure	3	Township Engineer with support from NJDEP	NJDEP Dam Restoration Loan Program	Dam will meet NJDEP standards and provide protection	\$350,000	Within 5 years	High	SIP	PP
2020-ROXBURY-004 (previous action)	Detention basin upgrade located at Whitegate Road	Problem: Downstream from the detention basin on Whitegate Road is need of repair. It causes flooding downstream which leads to erosion. Solution: Reconstruct the detention basin outlet on Whitegate Road and reconstruct the berm.	Existing	Flood, Severe Weather	3	Township Engineer	NJDEP Water Quality Restoration Grants, CDBG-DR	Reduce flooding; increase integrity of the detention basin	\$150,000	Within 3 years	High	SIP	PP
2020-ROXBURY-005 (previous action)	Conduct an inundation study of the Lake	Problem: An inundation study is needed of the Lake Hopatcong Dam. In the event of a failure, it is unknown as to what the full extent of flooding and damage	Existing	Dam Failure	3	NJDEP, Morris County and Sussex County, local municipalities	NJDEP Dam Restoration Loan Program	Identifies floodprone areas in and around the dam	\$40,000	4 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
	Hopatcong Dam	will be. The Township does not have jurisdiction over this dam and will need to be done jointly with NJDEP, Sussex County and Morris County. Solution: Conduct an inundation study of the Lake Hopatcong Dam to identify the extent of flooding in the event of a failure.											
2020-ROXBURY-006 (previous action)	Waterbody Maintenance and Sediment Removal	Problem: The Lamington River, Drakes Brook, and Succasunna Brook all flow through the Township. The Township does not have jurisdiction over these bodies of water and cannot perform the proper maintenance needed to reduce flooding and closed roadways. Debris and sediment need to be removed on a routine basis to allow the natural flow of water during heavy rain events. Township police and DPW staff are needed for traffic control and detour assistance. Solution: The Township will work with the NJDEP to develop a stream maintenance program to reduce the buildup of debris and sediment. This will reduce the potential for flooding and road closures and will also reduce the amount of overtime for police and DPW.	N/A	Flood, Severe Weather	3	NJDEP with support from Township Administration	FEMA FMA and HMGP, NJDEP Flood Hazard Risk Reduction and Resiliency Grant Program	Reduce manpower needed for detouring traffic, reduce or eliminate roadway flooding and road closures	\$500,000	Within 5 years	Medium	LPR	PR, PP
2020-ROXBURY-007	Emergency Generator for Township Senior Center	Problem: The Township's Senior Center is used as a shelter during an emergency. However, the center does not have a source of backup power. In the event of a utility outage, the center cannot serve as a proper shelter. Solution: Working with the engineer, determine the appropriate size generator to	Existing	All	3	Township Engineer	FEMA HMGP, Township Budget	Continuity of operations, shelter for residents	\$100,000	5 years	High	SIP	PP, ES



Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		power the Senior Center. Once determined, purchase the general and install it.											
2020-ROXBURY-008	Feasibility Study of Floodprone Roadways in the Township	<p>Problem: There are many roadways that are susceptible to flooding in the Township. This leads to road closures, police and DPW overtime, creates driving hazards, and damages infrastructure.</p> <p>Solution: Conduct a feasibility study to determine the source (or sources) of flooding in the Township and identify mitigation options to reduce or alleviate the problem. The Township will review the findings and determine the appropriate project(s) to implement and begin implementation.</p>	N/A	Flood, Severe Weather	3	<u>Township Engineer</u>	FEMA HMGP or FMA, Township Budget	Identifies solutions to reduce flood impacts, increases resiliency of Township	\$50,000+	5 years	Medium	LPR, SIP	PP, PR

Notes:

Acronyms and Abbreviations:

CAV	Community Assistance Visit
CRS	Community Rating System
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program

Timeline:

The time required for completion of the project upon implementation

Cost:

The estimated cost for implementation.

Benefits:

A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- **Local Plans and Regulations (LPR)** – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- **Structure and Infrastructure Project (SIP)** - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- **Natural Systems Protection (NSP)** – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.
- **Education and Awareness Programs (EAP)** – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.

CRS Category:



- *Preventative Measures (PR)* - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- *Property Protection (PP)* - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- *Public Information (PI)* - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- *Natural Resource Protection (NR)* - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- *Structural Flood Control Projects (SP)* - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- *Emergency Services (ES)* - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

Table 9.37-17. Summary of Evaluation and Action Priority

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-ROXBURY-001 (previous action)	Upgrade of Culvert at Hillside Avenue and Route 46	0	1	0	1	0	1	0	1	0	1	0	1	0	0	6	Medium
2020-ROXBURY-002 (previous action)	Comprehensive Emergency Planning revision for Roxbury Township	0	1	1	1	0	0	1	0	0	1	1	0	0	0	6	Medium
2020-ROXBURY-003 (previous action)	Ledgewood Pond Dam Renovation	1	1	1	1	1	1	0	1	0	1	0	1	1	0	10	High
2020-ROXBURY-004 (previous action)	Detention basin upgrade located at Whitegate Road	0	1	1	1	1	1	0	1	0	1	0	1	1	0	9	High
2020-ROXBURY-005	Conduct an inundation study of the Lake Hopatcong Dam	1	1	1	1	1	0	0	1	0	1	0	0	0	0	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
(previous action)																	
2020-ROXBURY-006 (previous action)	Waterbody Maintenance and Sediment Removal	0	1	1	1	0	0	0	1	0	1	1	0	1	0	7	Medium
2020-ROXBURY-007	Emergency Generator for Township Senior Center	1	1	1	1	1	1	0	0	1	1	1	1	0	0	10	High
2020-ROXBURY-008	Feasibility Study of Floodprone Roadways in the Township	0	1	1	1	0	1	0	0	0	1	1	1	0	0	7	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.



Table 9.37-18. 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
Dam Failure	-002, -005	-003, -007			-002, -007	-003, -007		
Disease Outbreak	-002	-007			-002, -007	-007		
Drought	-002	-007			-002, -007	-007		
Earthquake	-002	-007			-002, -007	-007		
Extreme Temperature	-002	-007			-002, -007	-007		
Flood	-002, -006	-001, -004, -006, -007			-002, -007	-001, -004, -007		
Geological Hazards	-002	-007			-002, -007	-007		
Harmful Algal Bloom	-002	-007			-002, -007	-007		
Hazardous Substances	-002	-007			-002, -007	-007		
Infestation	-002	-007			-002, -007	-007		
Severe Weather	-002, -006	-001, -006, -007			-002, -007	-001, -007		
Severe Winter Weather	-002	-007			-002, -007	-007		
Wildfire	-002	-007			-002, -007	-007		

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

RED = high ranked hazard

ORANGE = medium ranked hazard

YELLOW = low ranked hazard

9.37.8 Staff and Local Stakeholder Involvement in Annex Development

The Township of Roxbury 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 9.37-19. Contributors to the Annex

Entity	Title	Method of Participation
Michael Kobylarz, P.E.	Township Engineer	Attended meetings, point of contact for municipal annex, provided input on municipal annex
Rick Blood	Director of Public Works	Completed the stakeholder survey
Marc Palanchi	Police Chief	Completed the stakeholder survey
Kyle Hoffman	Fire Department Chief	Completed the stakeholder survey
Todd Vanderhoff	Supervisor Sewer Department	Completed the stakeholder survey
Gene Darcy	Foreman Water department	Completed the stakeholder survey



Entity	Title	Method of Participation
Bruce Bristol	President Chamber of Commerce	Completed the stakeholder survey
Eva Scartozzi	Assistant to the Director of Social Services	Completed the stakeholder survey



Figure 9.37-1. Township of Roxbury Hazard Area Extent and Location Map 1

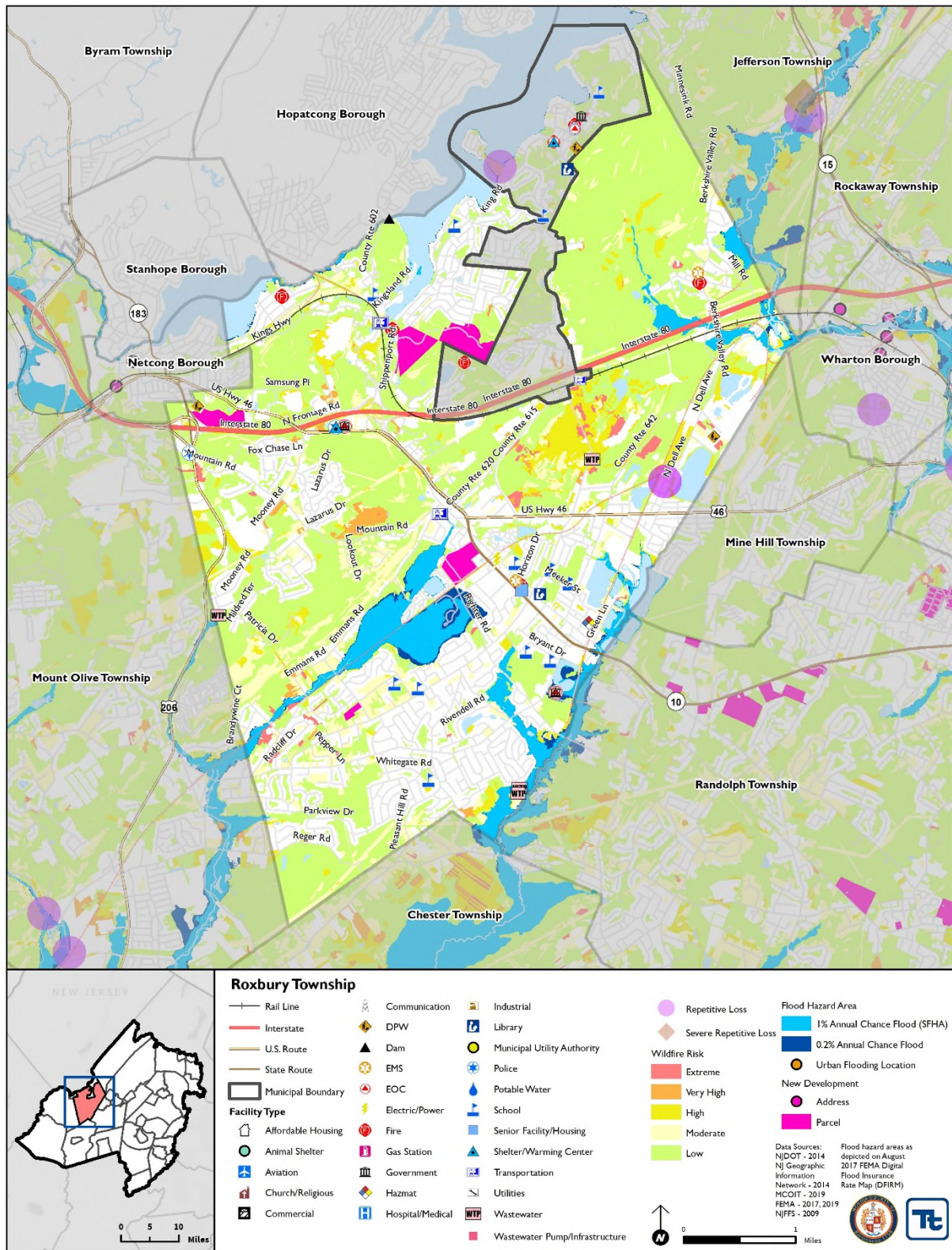
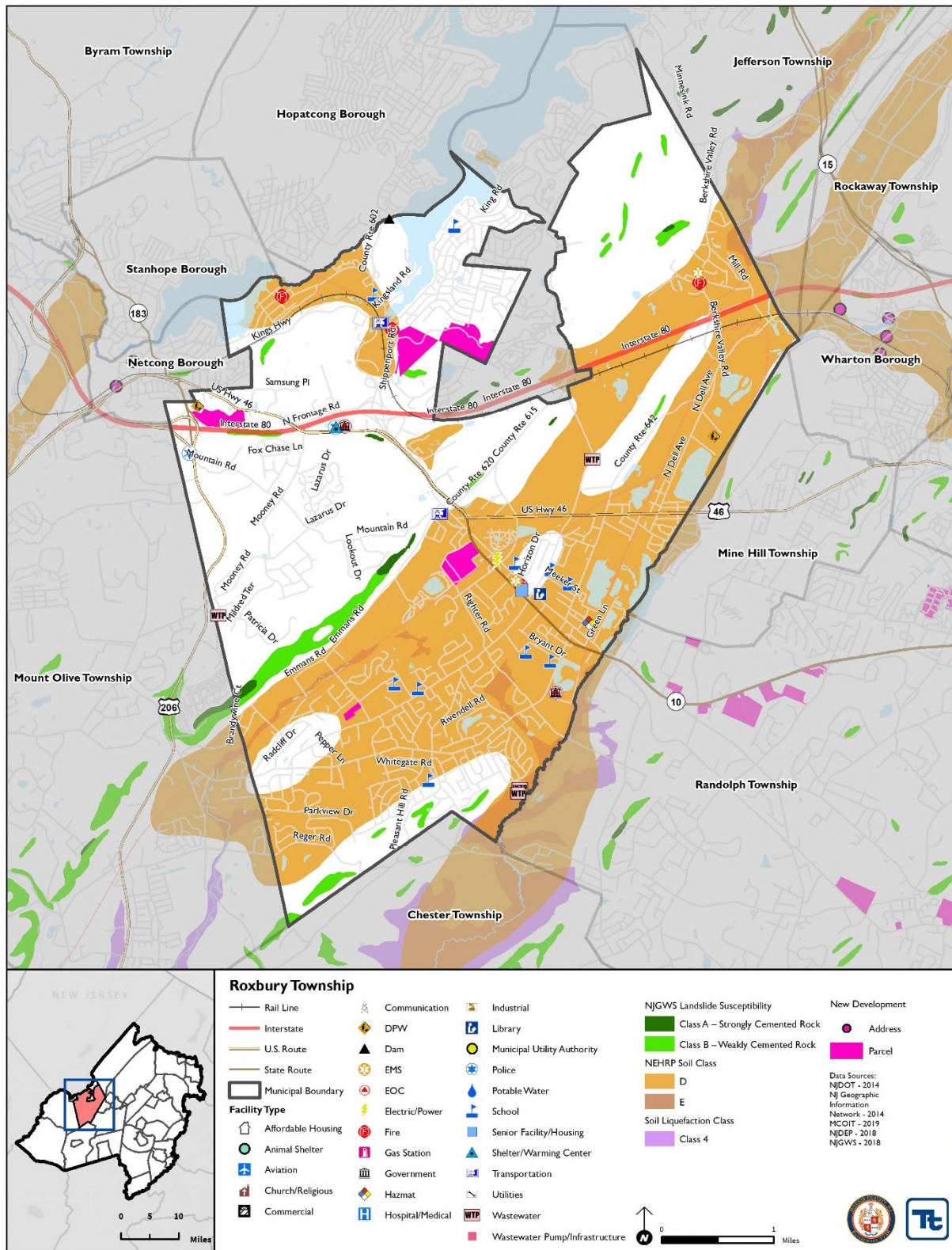




Figure 9.37-2. Township of Roxbury Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Waterbody Maintenance and Sediment Removal		
Project Number:	2020-ROXBURY-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The Lamington River, Drakes Brook, and Succasunna Brook all flow through the Township. The Township does not have jurisdiction over these bodies of water and cannot perform the proper maintenance needed to reduce flooding and closed roadways. Debris and sediment need to be removed on a routine basis to allow the natural flow of water during heavy rain events. Township police and DPW staff are needed for traffic control and detour assistance.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will work with the NJDEP to develop a stream maintenance program to reduce the buildup of debris and sediment. This will reduce the potential for flooding and road closures and will also reduce the amount of overtime for police and DPW.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	Depends on the maintenance program developed	Estimated Benefits (losses avoided):	Reduce manpower needed for detouring traffic, reduce or eliminate roadway flooding and road closures
Useful Life:	10 years	Goals Met:	3
Estimated Cost:	\$500,000	Mitigation Action Type:	LPR and SIP
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	Within 6 months of receiving funds	Potential Funding Sources:	FEMA FMA and HMGP, NJDEP Flood Hazard Risk Reduction and Resiliency Grant Program
Responsible Organization:	NJDEP with support from Township Administration	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Acquire all homes in the area of these waterbodies	\$1 million+	Not feasible; costly; loss tax base
	Implement township maintenance procedures in areas they are allowed to	Staff time	Does not address the main cause of 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:	Waterbody Maintenance and Sediment Removal	
Project Number:	2020-ROXBURY-006	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Reduce flood damage to structures and infrastructure
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	0	
Legal	0	The Township does not have jurisdiction to complete this project
Fiscal	0	Need funding
Environmental	1	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	



Action Worksheet			
Project Name:	Emergency Generator for Township Senior Center		
Project Number:	2020-ROXBURY-007		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards that cause utility outages		
Description of the Problem:	The Township's Senior Center is used as a shelter during an emergency. However, the center does not have a source of backup power. In the event of a utility outage, the center cannot serve as a proper shelter.		
Action or Project Intended for Implementation			
Description of the Solution:	Working with the engineer, determine the appropriate size generator to power the Senior Center. Once determined, purchase the general and install it.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Whatever level of storm causes the outage	Estimated Benefits (losses avoided):	Continuity of operations, shelter for residents
Useful Life:	30 years	Goals Met:	3
Estimated Cost:	\$100,000	Mitigation Action Type:	SIP
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Project Implementation:	Within 6 months of receiving funds	Potential Funding Sources:	FEMA HMGP, Township Budget
Responsible Organization:	Township Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation, Capital Improvement
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Install solar panels	\$25,000+	High maintenance cost; requires space to install; weather dependent
	Portable generator	\$5,000+	Cannot power the entire facility; frequent re-fueling
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 Generator for Township Senior Center	
Project Number:	2020-ROXBURY-007	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provide shelter for residents during a power outage
Property Protection	1	Allows building to fully operate
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	1	There is political support to implement this action
Legal	1	The Township has legal authority to implement this project
Fiscal	0	Need funding
Environmental	0	
Social	1	Provide shelter for residents during a power outage
Administrative	1	
Multi-Hazard	1	All hazards that can cause utility outages
Timeline	1	3 years
Agency Champion	0	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Feasibility Study of Floodprone Roadways in the Township		
Project Number:	2020-ROXBURY-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	There are many roadways that are susceptible to flooding in the Township. This leads to road closures, police and DPW overtime, creates driving hazards, and damages infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a feasibility study to determine the source (or sources) of flooding in the Township and identify mitigation options to reduce or alleviate the problem. The Township will review the findings and determine the appropriate project(s) to implement and begin implementation.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	To be determined once project is identified and implemented	Estimated Benefits (losses avoided):	Identifies solutions to reduce flood impacts, increases resiliency of Township
Useful Life:	2 years for study	Goals Met:	3
Estimated Cost:	\$50,000+	Mitigation Action Type:	LPR, SIP
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Project Implementation:	Within 6 months of receiving funds	Potential Funding Sources:	FEMA HMGP or FMA, Township Budget
Responsible Organization:	Township Engineer	Local Planning Mechanisms to be Used in Implementation if any:	Hazard Mitigation, Capital Improvement
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Action Worksheet		
Project Name:	Feasibility Study of Floodprone Roadways in the Township	
Project Number:	2020-ROXBURY-008	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	
Cost-Effectiveness	1	Benefits outweigh the costs
Technical	1	
Political	1	There is political support to implement this action
Legal	1	The Township has legal authority to implement this project
Fiscal	0	Need funding
Environmental	0	
Social	0	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	1	5 years
Agency Champion	0	
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	Medium	