



## 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
<b>Number of Building Permits for New Construction Issued Since the Previous HMP</b>					
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
<b>Recent Major Development and Infrastructure from 2015 to Present</b>					
320 Valley Street	Mixed Use	22 units	320 Valley Street	None	Construction almost complete
<b>Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years</b>					
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 <sup>th</sup> and Valley	Mixed Use	50 units	4 <sup>th</sup> 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
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).							
Zoning Code	Yes	Township of South Orange Village	Zoning Board of Adjustments	Yes on County Roads	No	No	No
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).							
Subdivisions	Yes	Township of South Orange Village	Planning Board	No	No	No	No
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).							
Stormwater Management	Yes	Township of South Orange Village	Village Engineer	NJDEP	Yes	No	No
Comment: South Orange Village Municipal Code Chapter 303 Stormwater Management. No specific citation.							
Post-Disaster Recovery	No	-	-	-	No	-	-
Comment:							
Real Estate Disclosure	No	-	-	-	No	-	-
Comment:							
Growth Management	No	-	-	-	No	-	-
Comment:							
Site Plan Review	Yes	Township of South Orange Village	Village Planner, Planning Board	No	No	No	No
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).							
Environmental Protection	No				No		
Comment:							
Flood Damage Prevention	Yes	Township of South Orange Village	Village Engineer	FEMA	Yes	Yes	No
Comment: South Orange Village Municipal Code Chapter 160 Flood Damage Prevention. Unclear what is adoption date. Authorized by NJSA 40:48-1 et seq.							



## 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 #.
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:</i> 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.							
<b>Planning Documents</b>							
Comprehensive / Master Plan	Yes	Township of South Orange Village	Village Planner	No	Yes	No	Yes
<i>Comment:</i> South Orange Master Plan. Adopted November 2006. Currently in update. See Mitigation Action 2020-S ORANGE-005.							
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:</i> Stream Corridor Management Plan. Adopted February 2007.							
Stormwater Management Plan	Yes	Township of South Orange Village	Engineering	NJDEP	Yes	No	No
<i>Comment:</i> Stormwater Management Plan April 2018. <a href="https://southorange.org/DocumentCenter/View/1385/Municipal-Storm-Water-Management-Plan">https://southorange.org/DocumentCenter/View/1385/Municipal-Storm-Water-Management-Plan</a>							
Stormwater Pollution Prevention Plan	Yes	Township of South Orange Village	Engineering	NJDEP	Yes	No	No
<i>Comment:</i> Stormwater Pollution Prevention Plan April 2018 <a href="https://southorange.org/DocumentCenter/View/1386/Storm-Water-Pollution-Prevention-Plan">https://southorange.org/DocumentCenter/View/1386/Storm-Water-Pollution-Prevention-Plan</a>							
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



## 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 #.
Comment: Vision Plan. Adopted October 2007.							
Shoreline Management Plan	No	-	-	-	No	-	-
Comment:							
Community Wildfire Protection Plan	No	-	-	-	No	-	-
Comment:							
Community Forestry Management Plan	Yes	Township of South Orange Village	Administration, DPW Shade Tree Department	No	No	No	No
Comment: Community Forestry Management Plan 2016-2020. Adopted December 2015.							
Transportation Plan	No	-	-	-	No	-	-
Comment:							
Agriculture Plan	No	-	-	-	No	-	-
Comment:							
Climate Action Plan	No	-	-	-	No	-	-
Comment:							
Tourism Plan	No	-	-	-	No	-	-
Comment:							
Business Development Plan	No	-	-	-	No	-	-
Comment:							
Other: Open Space Plan	Yes	Township of South Orange Village	Village Planner	No	No	No	No
Comment: Recreation and Open Space Element of the Land Use Master Plan. Adopted December 2004.							
Other: Redevelopment Plan	Yes	Township of South Orange Village	Village Planner	No	No	No	No
Comment: Redevelopment Plan. Adopted November 2009.							
Response/Recovery Planning							
Comprehensive Emergency Management Plan	Yes	Township of South Orange Village	Administration, Public Safety	County, State	Yes	No	No
Comment: Not available for review.							
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	No	-	-
Comment:							
Post-Disaster Recovery Plan	No	-	-	-	No	-	-
Comment:							



	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 #.
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?	Yes
- If no, who does? If yes, which department?	Engineering, Zoning, Building
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory?	No
-If yes, please describe briefly.	Mostly existing properties are redeveloped.
-If no, please quantitatively describe the level of buildout in the jurisdiction.	

### 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
<b>Administrative Capability</b>		
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
<b>Technical/Staffing Capability</b>		
Planners or engineers with knowledge of land development and land management practices	Yes	Engineering & Planner



Staff/Personnel Resource	Available?	Department/Agency/Position
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
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



Criterion	Response
Do you have a public information officer or communications office?	No
Do you have hazard mitigation information available on your website?	No
• If yes, briefly describe.	-
Do you use social media for hazard mitigation education and outreach?	Yes
• If yes, briefly describe.	Facebook, Twitter, Instagram
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes
• 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



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
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
Does your floodplain management program meet or exceed minimum requirements?	Meets
<ul style="list-style-type: none"> <li>If exceeds, in what ways?</li> </ul>	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"> <li>If so, state what they are.</li> </ul>	-
Are any RiskMAP projects currently underway in your jurisdiction?	No
<ul style="list-style-type: none"> <li>If so, state what they are.</li> </ul>	-
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
<ul style="list-style-type: none"> <li>If no, state why.</li> </ul>	-
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes



Criterion	Response
▪ If so, what type of assistance/training is needed?	Flood Plain Administrator
Does your jurisdiction participate in the Community Rating System (CRS)?	No
▪ 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?	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=a1ffec1b1f1e2357065aa5f620bffd5](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=a1ffec1b1f1e2357065aa5f620bffd5).

### 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 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	No losses.



Date(s) of Event	Event Type (disaster declaration if applicable)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
			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: Unknown

*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:	\$9,692,920	High
		500-year	32	500-year	545			
Geological	High Landslide Susceptibility Areas	Class A:	18	Class A:	6	Class A:	15365495.41	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:	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
<b>Hazardous Substances</b>	Port Newark is in Essex County (3 <sup>rd</sup> 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
<b>Utility Interruption</b>	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
<b>Terrorism</b>	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
<b>Transportation Failure</b>	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 9.18-16 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:

- Luddington 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 Luddington 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 medium.
- The Township of South Orange Village changed the hazard ranking for wildfire from low to medium.
- 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
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Low	High	High	Medium	Medium	Medium
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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 loss properties as a priority when applicable. Phase 1: Identify appropriate	Township Engineering, FPA	In progress.	Yes	2020-S ORANGE -003



## Section 9.20 - Township of South Orange Village

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 #
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.
Township of South Orange Village-10 Township will use the HMP as a	Township Planner (Consultant)	In progress.	Yes	2020-S ORANGE -005



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 #
guide when updating their Master Plan				

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	<u>Village Engineering</u>	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	All	3.1, 3.3	<u>Village Engineering</u>	Municipal budget	High	Low	Short	High	EAP	PI
2020-S ORANGE- 003	Mitigate of vulnerable structures	Mitigate vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/rel ocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a	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	Existing	Flood	1.2, 2.2	<u>Village Engineering, FPA</u>	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
		priority when applicable.	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	All	4.1, 5.4	<u>Village Planner</u>	Municipal Budget	Medium	Low	Long	Medium	LPR	PP, PI
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.		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

Potential FEMA HMA Funding Sources:

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

Timeline:

The time required for completion of the project upon implementation

Cost:

The estimated cost for implementation.

Benefits:



N/A Not applicable  
NFIP National Flood Insurance Program  
OEM Office of Emergency Management

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 Resilient	Community Capacity Building
Coastal Erosion and Sea Level Rise	-	-	-	-	-	-	-	-
Coastal Storm	x	x	x	-	x	x	x	-
Drought	-	-	-	-	-	-	-	-
Earthquake	-	-	-	-	-	-	-	-
Extreme Temperature	-	-	-	-	x	-	x	-
Flood	x	x	x	x	x	x	x	-
Geological hazards	-	-	-	-	-	-	-	-
Severe Weather	x	x	x	-	x	x	x	-
Severe Winter Weather	x	x	x	-	x	x	x	-
Wildfire	-	-	x	-	x	-	x	-
Civil Disorder	-	-	-	-	x	-	-	-
Cyber Attack	-	-	-	-	-	-	-	-
Disease Outbreak	-	-	-	-	-	-	-	-
Economic Collapse	-	-	-	-	-	-	-	-
Hazardous Substances	-	-	-	-	-	-	-	-
Utility Interruption	-	-	-	-	-	-	-	-
Terrorism	-	-	-	-	x	-	-	-
Transportation Failure	-	-	-	-	-	-	-	-

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

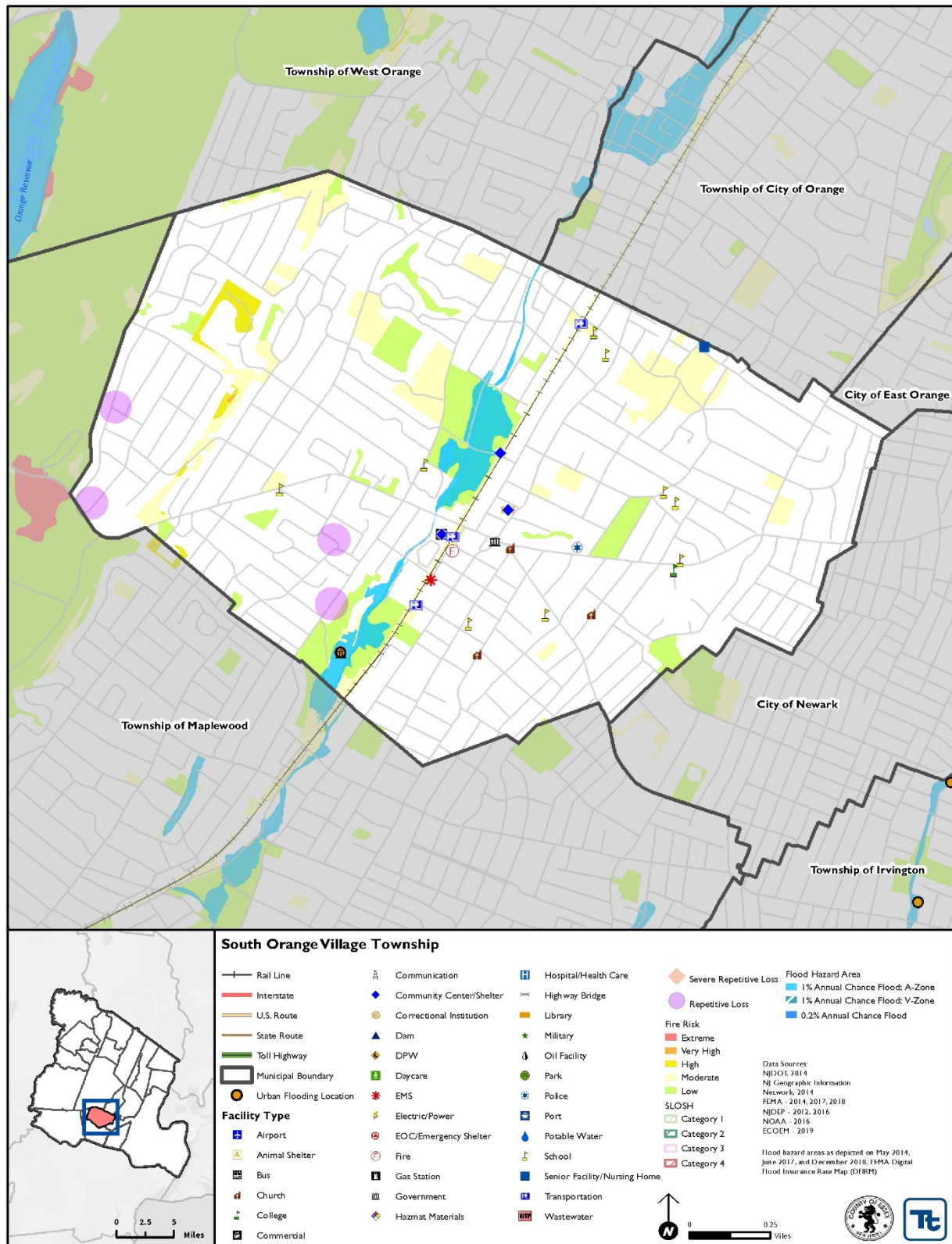
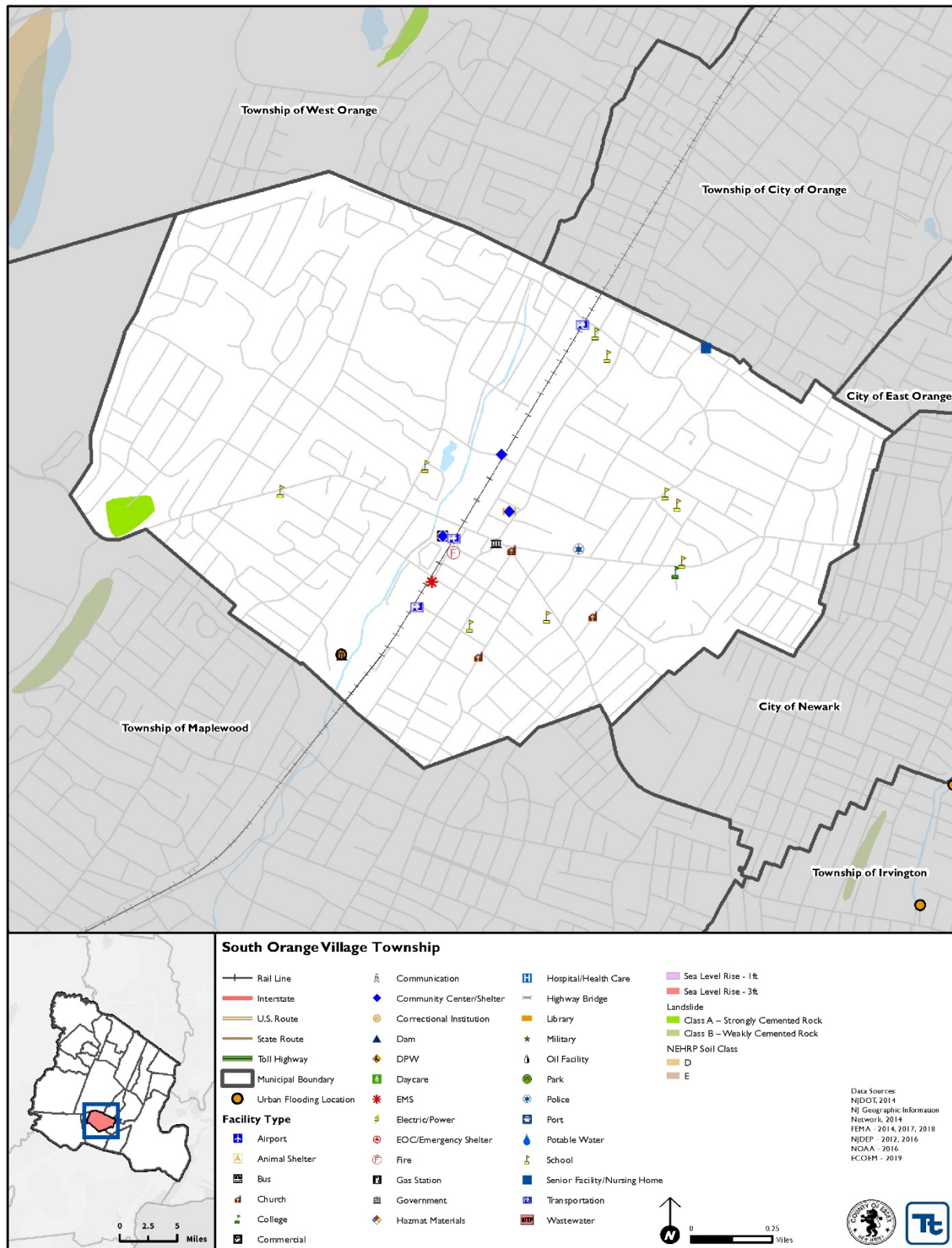




Figure 9.20-2. Township of South Orange Village Hazard Area Extent and Location Map 2





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	