APPENDIX F. PLAN MAINTENANCE TOOLS

This appendix summarizes additional activities and resources provided to plan participants to support the update of the mitigation strategy.

F.1 2015 GOALS AND OBJECTIVES REVIEW

County and municipal planning documents and recent policies changes were reviewed and discussed with the Planning Partnership to help inform the review and update of the mission statement, goals and objectives. Table F-1 summarizes the Steering Committee review and evaluation of the 2015 HMP goals and objectives. In summary, a new goal was added to the HMP to ensure the reduction of hazard impacts on people, property, the environment and economy were included. This was included as goal #1, at the top of the list, because of its significance to mitigation. In addition, increased understanding and adaptation to climate change and protection of community lifelines were added to the objectives.

Figure F-1. Goal and Objective Evaluation

Goal	Goal Evaluation (Keep as is? Change? Add another goal?)	Objective	Objective Evaluation (Keep as is? Change? Add another objective?)
Goal 1: Reduce the impacts of hazards on people, property, the environment and the economy	*New*	*1.A. Ensure continuity of government operations, emergency services, critical facilities and community lifelines during and after disaster and hazard events*	*New*
		1.B. Protect natural resources that serve a natural hazard mitigation function	
		1.C. Encourage the use of green stormwater infrastructure to mitigate flooding	
		1.D. Encourage new development outside of hazard areas	
Goal 2: Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.	*Keep, previously Goal 1*	2.A. Increase awareness of risks and understanding of the advantages of mitigation by the general public and local government officials	*Keep*
		2..B. Increase local government official awareness regarding funding opportunities for mitigation.	*Keep*
		2..C. Increase local government official awareness regarding opportunities for participation in and contributing to future Plan updates.	*Keep*
Goal 3: Improve data collection, use, and sharing to reduce the impact of hazards.	*Keep, previously Goal 2*	3.A. Improve availability to the county and participating municipalities of data related to all relevant hazards for use in future planning efforts.	*Keep*
		3.B. Provide government officials and local practitioners with educational opportunities and information regarding best practices for hazard mitigation planning, project identification and implementation	*Keep*
		3.C. Acquire and maintain detailed data regarding critical facilities *and lifelines* such that these sites can be prioritized and risk-assessed for possible mitigation actions.	Lifelines added
		3.D. Strengthen understanding of, and adaptation to, a changing climate	*New*

Goal	Goal Evaluation (Keep as is? Change? Add another goal?)	Objective	Objective Evaluation (Keep as is? Change? Add another objective?)
Goal 4: Improve capabilities, coordination, and opportunities at municipal and county levels to plan and implement hazard mitigation projects, programs, and activities.	*Keep, previously Goal 3*	4.A. Continue support of hazard mitigation planning, project identification and implementation at the municipal and county level.	*Keep*
		4.B. Support increased NFIP/CRS participation.	*Keep*
		4.C. Support increased integration of municipal/county hazard mitigation planning and floodplain management with effective municipal/ county zoning, subdivision regulation, and comprehensive planning.	*Keep*
		4.D. Elicit and support efforts by federal and state legislatures and agencies to address shortcomings in existing laws, programs and administrative rules related to hazard mitigation.	*Keep*
		4.E. Provide for user-friendly hazard-data accessibility for mitigation and other planning efforts and for private citizens.	*Keep*
		4.F. Provide direct support, where possible, to municipal mitigation programs.	*Keep*
Goal 5: Pursue opportunities to mitigate repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities.	*Keep, previously Goal 4*	5.A. Facilitate development and timely submittal of project applications meeting state and federal guidelines for funding (1) for NFIP Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties and (2) for hardening/retrofitting infrastructure and critical facilities *and lifelines* with highest vulnerability ratings.	*Lifelines added*
		5.B. Maintain and enhance local planning and regulatory standards related to future development and investments.	*Keep*

F.2 MITIGATION STRATEGY WORKSHOP RESOURCES

On March 3, 2020 a Mitigation Strategy Workshop was held for all plan participants. The workshop consisted of an overview of the mitigation strategy update followed by a break-out of small groups. The small groups discussed common problem statements and vulnerabilities and assisted each other by identifying mitigation alternatives. Resources available at the workshop included the following to assist with the identification of mitigation alternatives and the development of the mitigation strategy workshops found in Section 9 (Jurisdictional Annexes).

1. FEMA Local Mitigation Handbook
2. Strengths, Weaknesses, Obstacles and Opportunities exercise results
3. Citizen survey results
4. FEMA Mitigation action types (Table F-2)
5. FEMA Mitigation Ideas
6. Mitigation Catalog for Morris County (Table F-3)
7. FEMA Project Useful Life factsheet
8. Mitigation funding sources at the federal, state and local levels (Table F-4)

F.2.1 Types of Mitigation Actions

A mitigation action is a specific action, project, activity, or process taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals. The actions to reduce vulnerability to threats and hazards form the core of the plan and are a key outcome of the planning process.

The primary types of mitigation actions to reduce long-term vulnerability are:

- Local Plans and Regulations (LPR)
- Structure and Infrastructure Projects (SIP)
- Natural Systems Protection (NSP)
- Education and Awareness Programs (EAP)

Table Error! No text of specified style in document.**-1. FEMA Mitigation Action Types**

Mitigation Type	Description	Examples
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	Comprehensive plans Land use ordinances Subdivision regulations Development review Building codes and enforcement NFIP Community Rating System Capital improvement programs Open space preservation Stormwater management regulations and master plans
Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.	Acquisitions and elevations of structures in flood prone areas Utility undergrounding Structural retrofits Floodwalls and retaining walls Detention and retention structures Culverts Safe rooms
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	Sediment and erosion control Stream corridor restoration Forest management Conservation easements Wetland restoration and preservation
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	Radio or television spots Websites with maps and information Real estate disclosure Presentations to school groups or neighborhood organizations Mailings to residents in hazard-prone areas StormReady Firewise Communities

F.2.2 Mitigation Catalog

Table F-3 presents mitigation alternatives organized by hazard of concern at the personal, corporate and government scale.

DAM FAILURE		
Personal Scale	Corporate Scale	Government Scale
• ***Reduce exposure to the hazard***: o *No further development in failure inundation zone* • ***Reduce vulnerability to the hazard:*** o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability*** o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements.	• ***Manipulate the Hazard:*** o Increase freeboard • ***Reduce exposure to the hazard:*** o *No further development in failure inundation zone* • ***Reduce vulnerability to the hazard:*** o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability:*** o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements. o Ensure EAPs are kept in compliance with State regulations	• ***Manipulate the Hazard:*** o Increase freeboard • ***Reduce exposure to the hazard:*** o No further development in failure inundation zone • ***Reduce vulnerability to the hazard:*** o Structural flood control: levee's, dams, channelization, revetments. o Regular inspection, maintenance and enforcement program to help ensure structural integrity of dams and levees • ***Increase Capability:*** o More public outreach and education efforts o Conduct a watershed analysis for proposed dam or reservoir projects

DROUGHT		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Consider stored water/captured water techniques during dry seasons. • ***Reduce vulnerability to the hazard:*** o Drought resistant landscapes o Reduce water system losses o Regularly check for leaks to minimize water supply losses o Install low-flow water saving showerheads and toilets o Turn water flow off while brushing teeth or during other cleaning activities o Adjust sprinklers to water the lawn and not the sidewalk or street. o Run the dishwasher and washing machine only when they are full. o Check for leaks in plumping or dripping faucets. o Install rain-capturing devices for irrigation. o Install graywater systems in homes to encourage water reuse. • ***Increase Capability*** o Practice active water conservation techniques. o Seek ways to operate wells in such a way to enhance their functional longevity and supply capability.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Consider stored water/captured water techniques during dry seasons. • ***Reduce vulnerability to the hazard:*** o Drought resistant landscapes o Reduce private water system losses o Identify alternate water supply sources. o Install low-flow water saving showerheads and toilets o Adjust sprinklers to water the lawn and not the sidewalk or street. • ***Increase Capability:*** o Practice active water conservation o Develop a COOP o Create a water conservation plan.	• ***Manipulate the Hazard:*** o Groundwater recharge through stormwater management • ***Reduce exposure to the hazard:*** o Identify and create groundwater back up sources. o Create /identify new impounded water supply points. o Developing new or upgrading existing water delivery systems to eliminate breaks and leaks. • ***Reduce vulnerability to the hazard:*** o Water use conflict regulations o Reduce water system losses o Distribute water saving kits o Identify sites ideally suited for ground water recharge. o Implement stormwater retention in regions ideally suited for groundwater recharges. o Utilize drought resistant landscapes on community owned facilities. o Encourage citizens to take water-saving measures • ***Increase Capability:*** o Public education on drought resistance o Identify alternative water supplies for time of drought. Mutual aid agreements with alternative suppliers. o Develop a drought contingency plan o Develop criteria-"triggers" for drought related actions o Improve accuracy of water supply forecasts

DROUGHT		
		o Provide incentives to influence active water conservation techniques such as water user rate reductions. o Establish protocol for salt water de-salinization to be implemented during conditions of severe drought. o Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their homes. o Use of water buffalo tankers o Promote well usage techniques that strive to enhance functional longevity and supply capability of private water supply wells. o Develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc.

EARTHQUAKES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Locate outside of hazard area (off soft soils) • ***Reduce vulnerability to the hazard:*** o Retrofit structure (anchor house structure to foundation) o Secure household items that can cause injury or damage such as water heaters, bookcases, and other appliances o Build to higher design standards • ***Increase Capability*** o Practice "drop, cover and hold" o Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72 hr. self-sufficiency during an event o Increase capability by having cash reserves for reconstruction o Become informed on the hazard and risk reduction alternatives available. o Develop a post-disaster action plan for your household.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Locate/relocate mission critical functions outside hazard area where possible. • ***Reduce vulnerability to the hazard:*** o Build redundancy for critical functions/facilities o Retrofit critical buildings/areas housing mission critical functions. • ***Increase Capability:*** o Adopt higher standard for new construction -- Consider "performance-based design' when building new structures o Increase capability by having cash reserves for reconstruction o Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. o Develop a Continuity of Operations Plan (COOP)	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Locate critical facilities or functions outside of hazard area where possible. • ***Reduce vulnerability to the hazard:*** o Harden infrastructure o Provide redundancy for critical functions o Adopt higher regulatory standards for structures o Conduct "rapid screening" programs for critical facilities to identify facilities that may be particularly prone to EQ damage, then develop investigation/action plans to address such structures • ***Increase Capability:*** o Provide better hazard maps o Provide technical information and guidance o Enact tools to help manage development in hazard areas: tax incentives, information o Include retrofitting/replacement of critical system elements in CIP o Develop strategy to take advantage of post disaster opportunities o Warehouse critical infrastructure components such as pipe, power line, and road repair material. o Develop and adopt a Continuity of Operations / Continuity of Government Plan (COOP/COG) o Initiate triggers guiding improvements such as: (< 50% substantial damage/improvements)

EARTHQUAKES		
		o Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. o Develop a post disaster action plan that includes a grant funding and debris removal components. o Utilize warning systems o Educate builders and developers on seismic construction standards

EXTREME TEMPERATURES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Insulate structure o Provide redundant power. o Plant appropriate trees near home ("Right tree, right place" National Arbor Day Foundation Program). • ***Reduce vulnerability to the hazard:*** o Air condition non-conditioned buildings. o Install backup heat (e.g. wood burning stoves) o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability*** o Be aware of impending heat waves. o Inform yourself on the do's and don'ts during heat waves. o Have fans available for use during peak demands in leu of air conditioning. o Install back-up generators o Know the location of cooling and warming shelters	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create redundancy to power supply to deal with power grid vulnerability during high demands • ***Reduce vulnerability to the hazard:*** o Air condition non-conditioned buildings. o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability:*** o Inform employees of the seriousness of heat waves. o Monitor weather forecasts. o Establish a COOP.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create redundancy to power supply to deal with power grid vulnerability during high demands • ***Reduce vulnerability to the hazard:*** o Air condition public buildings. o Incorporate "green building" methods (e.g. green roofs) • ***Increase Capability:*** o Inform the public on the seriousness of heat-waves o Identify populations vulnerable to extreme heat (elderly, poor) for early warning during potential heat waves. o Enhance weather forecasting capability o Distribute fans to vulnerable populations. o Promote selective approaches to cooling your residences and businesses during peak demands.

FLOOD		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Clear stormwater drains and culverts • ***Reduce exposure to the hazard***: o Locate or re-locate outside of hazard area o Institute low impact development techniques on property • ***Reduce vulnerability to the hazard:*** o Retrofit existing structures and utilities above Base Flood Elevation (BFE) o Floodproof existing structures (wet- or dry floodproofing). o Store hazardous materials above BFE or outside of floodprone areas • ***Increase Capability*** o Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72-hr. self-sufficiency during and after an event o Buy flood insurance	• ***Manipulate the Hazard:*** o Clear stormwater drains and culverts • ***Reduce exposure to the hazard:*** o Locate business critical facilities or functions outside hazard area o Institute low impact development techniques on property • ***Reduce vulnerability to the hazard:*** o Build redundancy for critical functions/ retrofit critical buildings. o Provide flood-proofing measures when new critical infrastructure must be located in floodplains. o Harden structures and infrastructure (wet and dry-floodproofing) o Store hazardous materials above BFE or outside of floodprone areas • ***Increase Capability:*** o Increase capability by having cash reserves for reconstruction o Develop and adopt a Continuity of Operations Plan (COOP) o Solicit 'cost-sharing" through partnerships with private sector stakeholders on projects with multiple benefits. o Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements. o Ensure that all dam EAP's are kept in compliance with State regulations	• ***Manipulate the Hazard:*** o Clear stormwater drains and culverts o Dredging, levee construction, providing retention areas… o Structural flood control: levee's, dams, channelization, revetments. o Construct regional stormwater control facilities o Lead and develop a county-wide stream clearing strategy including the development of thresholds for response/action. • ***Reduce exposure to the hazard:*** o Locate/re-locate critical facilities outside of hazard area o Acquire or relocate identified repetitive loss properties. o Promote open space uses in identified high hazard areas via techniques such as: PUD's, easements, setbacks, greenways, sensitive area tracks. o Adopt land development criteria such as PUD's, Density transfers, clustering o Institute low impact development techniques on property o Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff o Pass an ordinance to incorporate additional zoning classifications into flood zones within each municipality. o Increase floodplain standards within municipal. o Continue development application reviews by County Planning Board to reduce risky development practices.

FLOOD		
		• ***Reduce vulnerability to the hazard:*** o Harden structures and infrastructure (wet and dry-floodproofing) o Provide redundancy for critical functions and infrastructure o Adopt appropriate regulatory standards such as cumulative substantial improvement/damage, freeboard, lower substantial damage threshold, compensatory storage. o Stormwater management regulations and master planning. o Adopt "no-adverse impact" floodplain management policies that strive to not increase the flood risk on down-stream communities. o Participate in the Community Rating System (CRS) o Implement as-built regulatory requirements o Implement site review ordinances/requirements o Establish stream maintenance programs with stakeholders o Incorporate retrofitting/replacement of critical facilities and infrastructure in Capital Improvement Plans (CIPs) o Promote the use of vegetation/plants as green erosion control measures to reduce localized flooding. • ***Increase Capability:*** o Produce better hazard maps, and improve access to flood hazard mapping o Capture/survey "high-water" marks during flood events. o Provide technical information and guidance on appropriate mitigation

FLOOD		
		options available to businesses and homeowners o Enact tools to help manage development in hazard areas (stronger controls, tax incentives, information) o Establish an additional layer of zoning within flood hazard areas o Develop strategy to take advantage of post disaster opportunities o Improve compliance with and enforcement of the NFIP o Develop mitigation partnerships with regional stakeholders o Join Community Rating System (CRS) program, or improve level of participation in CRS o Develop and implement a public information strategy for flood hazard awareness, flood insurance (NFIP) and mitigation o Maintain existing data as well as gather new data needed to define risks and vulnerability. o Create a building and elevation inventory of structures in the floodplain o Identify flood prone areas that may be in need of new flood studies o Establish a program to identify and educate owners of flood-prone properties of potential mitigation options (e.g. elevations, relocations) o Charge a hazard mitigation fee on all new permits to create a hazard mitigation funding source for initiatives or grant cost share requirements.

FLOOD		
		o Integrate floodplain management policies into other planning mechanisms within the planning area. o Establish a Stormwater Utility to deal with urban drainage/flooding issues o Establish incentives to promote flood hazard mitigation of private property (e.g. permit fee waivers). o Adopt ordinances/standards for cumulative damages and/or improvements o Upgrade NFIP Floodplain ordinance, as well as other ordinances to current or above current standards. o Develop and adopt a COOP o Join "Storm Ready" Program o Participate in county and regional training programs o Provide additional training/certification to NFIP floodplain administrators and code officials. o Implement annual training to account for high turnover of municipal officials. o Maintain and enhance flood forecasting ability, including the establishment and maintenance of critical stream gages o Promote awareness and participation in alert systems o Support and participate in regional flood management efforts, such as the Flood Mitigation Task Force or similar efforts o Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones. o Provide continued and enhanced training for emergency responders

FLOOD		
		o Establish a revolving "bank" or budget line item to fund grant application support o Continue to review updated Flood Insurance Rate Maps to ensure accuracy as well as maintaining lines of communication with homeowners to make them aware of potential changes related to their property status. o Provide trainings for FPA's on the NFIP/Floodplain Best Practices and also pursue CFM accreditation for municipal FPA's. o Build and maintain relationships to develop regional watershed/floodplain mitigation solutions. o Pursue grant funding opportunities to fund repairs of catchments and infrastructure on a proactive basis. o Explore grant funding opportunities related to climate change to fund mitigation projects.

GEOLOGIC HAZARD		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability*** o None	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability:*** o None	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Consider hazard areas in land-use planning, zoning and development siting o Acquire structures in highest hazard areas (demolish and convert to restricted open space) o Relocation of Structures o Open Space Preservation • ***Reduce vulnerability to the hazard:*** o Consider hazard areas in land-use planning and development siting o Stabilize vulnerable slopes near structures and infrastructure. o Work with stakeholders to develop appropriate risk reduction strategies. • ***Increase Capability:*** o Increase understanding of hazard areas (e.g. Landslide Susceptibility Maps) - geotechnical surveys, LIDAR and mapping o Work with stakeholders such as USGS, NJDEP to develop appropriate risk reduction strategies. o Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones o Develop county-level programs to document slide events (landslide inventory), and maintain its currency

SEVERE WEATHER		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o None • ***Reduce vulnerability to the hazard:*** o Retrofit structures (improved roofing, glazing, insulation, etc.) o Provide for redundant heat and power o Contact municipality or utilities to trim or remove trees that could affect power lines o Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program. • ***Increase Capability*** o Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio) o Promote 72-hour self-sufficiency o Provide for redundant heat and power o Participate in NOOA's SKYWARN training to increase knowledge and awareness of hazard	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Relocate critical infrastructure, such as power lines, underground o Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations. • ***Increase Capability:*** o Contact municipality or utilities to trim or remove trees that could affect power lines o Create redundancy (e.g. backup generators) o Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio) o Develop a Continuity of Operations Plan (COOP) o Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Harden infrastructure such as locating utilities underground. o Trimming trees back from power lines o Designate snow routes and strengthen critical road sections and bridges. o Adopt ordinances that regulate the type and quantity of trees planted near utility lines o Relocate critical infrastructure, such as power lines, underground • ***Increase Capability:*** o Support programs that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc. o Enforce building codes that require all roofs to withstand snow loads. o Increase communication alternatives o Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. o Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines o Promote awareness and participation in alert systems o Provide NOAA weather radios to the public o Create/Enhance "mutual aid" agreements for response to all emergencies o Create/identify evacuation routes to be utilized during severe storm events.

SEVERE WEATHER		
		o Develop debris management plans. o Join "Storm-Ready" program o Provide early warning of impending severe storm events to identified critical or essential facilities. This would include facilities such as large employments centers, schools, hospitals o Promote emergency power supplies to private property. o Improve, expand or harden communications facilities and services o Recruit additional emergency personnel or use mutual aid agreements o Increase sheltering capabilities o Increase capability to respond to power outages and downed power lines. Establish partnerships with utility providers through pro-active planning.

SEVERE WINTER STORMS		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation) • ***Reduce vulnerability to the hazard:*** o Insulate House to provide greater thermal efficiency and reduce heat loss. o Provide redundant heat and power o Insulate Structure o Ensure natural gas input/release valves do not get covered in snow • ***Increase Capability*** o Trim or remove trees that could affect power lines o Prepare emergency food and supplies to be self-sufficient for at least 72 hours in the event of a severe winter storm. o Be aware of inclement weather conditions and move your vehicles off of the street as severe weather systems approach. o Retrofit structures	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Relocate critical infrastructure, such as power lines, underground o Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations. o Install tree wire • ***Increase Capability:*** o Trim or remove trees that could affect power lines o Create redundancy in utilities and communications o Develop a Continuity of Operations Plan (COOP) to address operations before, during and after coastal storm events. o Utilize weather radios at the work place to keep your employees aware of severe weather conditions.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o Harden infrastructure such as locating utilities underground where appropriate. o Trimming trees back from power lines o Designate snow routes and strengthen critical road sections and bridges. o Adopt codes and regulations that address the issues of parking of vehicles along roadways during severe weather events. o Develop or enhance the capacity/capability of stormwater conveyance systems. o Provide backup power sources at vital critical facilities. • ***Increase Capability:*** o Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc. o Establish and enforce building codes that require all roofs to withstand snow loads--Develop/Improve/Enforce building Codes in Hazard Areas o Increase communication alternatives o Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. o Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines

SEVERE WINTER STORMS		
		o Provide weather radios to vulnerable populations o Enhance public awareness campaigns to address those issues of alert and warning and actions to take during severe weather events. o Utilize the best available technology to enhance the warning systems for all severe weather events (i.e.: tornado warning systems). o Coordinate severe weather warning capabilities and the dissemination of warning amongst those agencies within the planning are with the highest degree of capability. o Encourage local ordinances for planting tree near lines and join Tree City USA. o Increase tree management programs. o Join the Community Rating System o Join "Storm-Ready" o Retrofit critical structures and promote hazard resistant construction o Keep open communications and education of hazards for mobile home communities o Retrofit above-ground utilities to underground facilities if appropriate o Create a salt reserve or research alternates to stretch salt reserve. o Ensure accessibility to hospital. o Provide better debris logistics and removal. o Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.

WILDFIRE		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Clear potential fuels on property; dry, overgrown underbrush; diseased trees • ***Reduce exposure to the hazard***: o Clean and maintain defensible space around structures o Locate outside hazard area o Mow regularly • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structures, provide water on site. o Use fire-retardant building materials o Create defensible spaces around your home. • ***Increase Capability*** o Employ Firewise techniques to safeguard your home o Identify alternative water supply points proximate to your home such as swimming pools, lakes, streams o Support your local fire department o Be aware of weather conditions that support/enhance the probability of wildfires	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** • • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structure and infrastructure and provide water onsite o Use fire-retardant building materials o Provide stored water to be utilized for fire fighting with appropriate fire department connections at facilities not equipped with fire hydrants or inadequate fire hydrant spacing • ***Increase Capability:*** o Support Firewise community initiatives	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Clear fuels (dry underbrush, diseased trees) on land that can trigger and maintain wildfires o Implement Best Management Practices on public lands • ***Reduce vulnerability to the hazard:*** o Create and maintain defensible space around structure and infrastructure o Higher regulatory standards o Establish water main supply and hydrants in unhydranted areas o Decrease hydrant spacing o Purchase • ***Increase Capability:*** o More public outreach and education efforts including an active “Firewise” program o Identify fire response and alternative evacuation routes o Seek alternative water supplies in urban wildland interface areas. o Become a "Firewise" community o Increase capability to fight wildfires utilizing equipment that can support wildfire fighting such as: tankers, engines with "pump-and-run" capabilities, dump tanks for tanker shuttle operations. o Develop/implement wildfire management plans. o Establish Mutual Aid Agreements with the Tender Task Force

WILDFIRE		
		o Attend the Tender Apparatus Response Plan (TARP) training conducted by Kean University

HARMFUL ALGAL BLOOM		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o None • ***Reduce exposure to the hazard***: o Comply with harmful algal bloom rules and regulations to minimize the exposure to HAB. • ***Reduce vulnerability to the hazard:*** o Form citizen action groups to promote awareness and best practices on local levels. • ***Increase Capability*** o Regularly check Morris County website for information	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o None • ***Reduce vulnerability to the hazard:*** o None • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Harmful Algal Bloom events throughout the county/region.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** o Create/disseminate planting guides which explain Harmful Algal Bloom safety both recreationally and for drinking water purposes. o • ***Reduce vulnerability to the hazard:*** o Pass municipal ordinances to enforce best practices for invasive species at the local level. • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Harmful Algal Bloom throughout the county/region. o Work with federal/state agencies to disseminate information to local municipalities regarding Harmful Algal Bloom o Disseminate information to the general public to educate them on Harmful Algal Bloom o Work with stakeholders to identify and expand resources for prevention and early detection of Harmful Algal Bloom o Apply for funding to increase testing inlet/outlet o Highlands/Public/Private Partnership (Ringwood in Passaic County has been successful at obtaining grant funding and application is a model template)

INFESTATION/INVASIVE SPECIES		
Personal Scale	Corporate Scale	Government Scale
• ***Manipulate the Hazard***: o Participate in quarantine, control, or eradication programs. • ***Reduce exposure to the hazard***: o • ***Reduce vulnerability to the hazard:*** o Form citizen action groups to promote awareness and best practices on local levels. • ***Increase Capability*** o Become familiar with recognition and inspect your properties o Comply with Invasive Species rules and regulations to minimize the chance for invasive species to spread. o Broaden collaborations focused on ecosystem restoration and ecosystem-based management.	• ***Manipulate the Hazard:*** o None • ***Reduce exposure to the hazard:*** • • ***Reduce vulnerability to the hazard:*** o • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region.	• ***Manipulate the Hazard:*** o Work with Federal/State agencies on quarantine, control, or eradication programs for invasive species. • ***Reduce exposure to the hazard:*** o Create/disseminate planting guides which explain which types of plants and vegetation are safe to plant within the county. • ***Reduce vulnerability to the hazard:*** o Pass municipal ordinances to enforce best practices for invasive species at the local level. • ***Increase Capability:*** o Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region. o Work with federal/state agencies to disseminate information to local municipalities regarding Invasive Species o Disseminate information to the general public to educate them on Invasive Species o Work with stakeholders to identify and expand resources for prevention and early detection of invasive species. o Broaden collaborations focused on ecosystem restoration and ecosystem-based management.

G.1.1 Potential Mitigation Funding Sources

While it is important to recognize the mitigation strategies for each jurisdiction to help achieve the mitigation goals and objectives of the HMP, it is also important to provide sources for funding to implement these strategies. The table below provides a list of programs, descriptions, and links for those seeking funding sources. Please note that this table is not intended to be a comprehensive list, but rather a starting point to help identify potential sources of funding for the identified mitigation strategies.

Program	Description	Lead Agency	Website
Federal			
Hazard Mitigation Assistance (HMA)	Grants to provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages – includes FMA, HMGP, PDM	FEMA	https://www.fema.gov/hazard-mitigation-assistance
Flood Mitigation Assistance (FMA)	Program Grants to States and communities for pre-disaster mitigation planning and projects to help reduce or eliminate the long-term risk of flood damage to structures insurable under the National Flood Insurance Program	FEMA	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program (HMGP)	Grants to States and communities for planning and projects providing long-term hazard mitigation measures following a major disaster declaration	FEMA	https://www.fema.gov/hazard-mitigation-grant-program
Pre-Disaster Mitigation (PDM) Competitive Grant Program	Grants to States and communities for planning and projects that provide long-term hazard pre-disaster mitigation measures	FEMA	https://www.fema.gov/pre-disaster-mitigation-grant-program
Public Assistance: Hazard Mitigation Funding Under Section 406	Hazard mitigation discretionary funding available under Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act following a Presidentially declared disaster	FEMA	https://www.fema.gov/news-release/2017/05/03/4309/fema-hazard-mitigation-grants-404-and-406
Assistance to Firefighters Grant Program	The primary goal of the Assistance to Firefighters Grants (AFG) is to enhance the safety of the public and firefighters with respect to fire-related hazards by providing direct financial assistance to eligible fire departments, nonaffiliated Emergency Medical Services organizations, and State	FEMA	https://www.fema.gov/welcome-assistance-firefighters-grant-program

Program	Description	Lead Agency	Website
	Fire Training Academies. This funding is for critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience.		
High Hazard Potential Dams (HHPD) Rehabilitation Grant	The Rehabilitation of High Hazard Potential Dams Grant Program (HHPD provides technical, planning, design, and construction assistance in the form of grants to non-Federal governmental organizations or nonprofit organizations for rehabilitation of eligible high hazard potential dams.	FEMA	https://www.grants.gov/web/grants/view-opportunity.html?oppId=316238
Fire Management Assistance Grant Program	Assistance for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster. Provides a 75% Federal cost share and the State pay the remaining 25% for actual cost.	FEMA	https://www.fema.gov/fire-management-assistance-grant-program
Disaster Housing Program	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage and rental assistance	HUD	https://www.hud.gov/program_offices/public_indian_housing/publications/dhap
HOME Investment Partnerships Program	Grants to local and state government and consortia for permanent and transitional housing, (including financial support for property acquisition and rehabilitation for low income persons)	HUD	https://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/
HUD Disaster Recovery Assistance	Grants to fund gaps in available recovery assistance after disasters (including mitigation)	HUD	https://www.hud.gov/info/disasterresources
Section 108 Loan Guarantee	Enables states and local governments participating in the Community Development Block Grant (CDBG) program to obtain federally guaranteed loans for disaster-distressed areas	HUD	https://www.hudexchange.info/programs/section-108/
Smart Growth Implementation Assistance (SGIA) program	The SGIA program focuses on complex or cutting-edge issues, such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can	EPA	https://www.epa.gov/smartgrowth

Program	Description	Lead Agency	Website
	submit proposals under 4 categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design or medical and social service facilities siting.		
Partners for Fish and Wildlife	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats	U.S. Fish and Wildlife Service	https://www.fws.gov/partners/
FHWA Emergency Relief Program	Fund for the repair or reconstruction of Federal-aid highways that have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause	U.S. Department of Transportation (DOT)	https://www.fhwa.dot.gov/programadmin/erelief.cfm
Transportation Investment Generating Economic Recovery (TIGER)	Investing in critical road, rail, transit and port projects across the nation	U.S. DOT	https://www.transportation.gov/tags/tiger-grants
Community Facilities Direct Loan & Grant Program	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings.	USDA	https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program
Emergency Loan Program	USDA's Farm Service Agency (FSA) provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine	USDA	https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/index
Emergency Watershed Protection (EWP) program	Provide assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
Financial Assistance	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/

Program	Description	Lead Agency	Website
	resources on agricultural lands and non-industrial private forest land		
Emergency Management Performance Grants (EMPG) Program	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities	U.S. DHS	https://www.fema.gov/emergency-management-performance-grant-program
Reimbursement for Firefighting on Federal Property	Provides reimbursement only for direct costs and losses over and above normal operating costs.	U.S. DHS	https://www.usfa.fema.gov/grants/firefighting_federal_property.html
Department of Homeland Security Grant Program (HSGP)	HSGP is composed of three interconnected grant programs including the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Operation Stonegarden (OPSG). Together, these competitive grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration.	U.S. DHS	https://www.dhs.gov/homeland-security-grant-program-hsgp
Land & Water Conservation Fund	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies)	National Park Service	https://www.nps.gov/subjects/lwcf/index.htm
Land and Water Conservation Fund	Funding to states, local and conservation organizations for outdoor recreational development, renovation, land acquisition, and planning.	U.S. Department of the Interior	https://www.doi.gov/lwcf
USSBA	Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.	Small Business Administration (SBA)	https://www.sba.gov/funding-programs/disaster-assistance
State			

Program	Description	Lead Agency	Website
Environmental Infrastructure Financing Program	Qualified borrowers receive loans in two equal parts: Approximately one half to three quarters comes from a 0-interest State Revolving Fund maintained by the NJDEP. The other portion comes from proceeds of highly rated tax-exempt revenue bonds sold by the Trust. Combining these two funds results in a loan that is 50 to 75% lower than traditional loan rates.	NJDEP	
Meadowlands Infrastructure Trust Fund	Grants are available for stormwater management, updating GIS systems, affordable housing planning, and solid waste disposal for the counties and municipalities that are under this Commission.	NJ Sports and Exposition Authority	
New Jersey Green Acres Program	It is financed with Garden State Preservation Trust funds through three partnering agencies: The Green Acres Program, a division of the Department of Environmental Protection to preserve natural lands and recreational parks. The Farmland Preservation Program is administered by the independent State Agriculture Development Committee to acquire the development rights on privately owned farmland. Historic Preservation Program is administered by the independent New Jersey Historic Trust to provide matching grants to save important historic buildings.	NJDEP	https://www.nj.gov/dep/greenacres/
New Jersey Small Cities Communities Development Block Grants	Provide funds for economic development, housing rehabilitation, community revitalization, and public facilities designated to benefit people with low and moderate incomes, or to address recent local needs for which no other source of funding is available to non-entitlement counties and municipalities.	NJDCA	https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html
New Jersey Conservation Foundation (NJCF)	NJCF is a private, not-for-profit organization. Through acquisition and stewardship, NJCF protects strategic lands, promotes strong land use policies, and forges partnerships to achieve conservation goals. Grants to help fund preservation activities.	NJCF	https://www.njconservation.org/what-we-do/

Program	Description	Lead Agency	Website
The New Jersey Infrastructure Bank	Two programs provide and administer low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Approximately $350 million is awarded annually. 1. New Jersey Environmental Infrastructure Trust (NJEIT) for the purpose of financing water quality infrastructure projects that enhance ground and surface water resources, ensure the safety of drinking water supplies, protect the public health and make possible responsible and sustainable economic development. 2. The New Jersey Transportation Infrastructure Bank (NJTIB) is an independent State Financing Authority responsible for providing and administering low interest rate loans to qualified municipalities, counties, and regional authorities in New Jersey for the purpose of financing transportation quality infrastructure projects.	NJDEP	https://www.njib.gov/
Drinking Water State Revolving Fund (DWSRF)	The DWSRF program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Infrastructure Trust funds. Additionally, the Water Supply program provides operator licensing and training support as well as financial assistance through the DWSRF program.	NJDEP	https://www.state.nj.us/dep/watersupply/dws_loans.html
New Jersey Water Bank	New Jersey Water Bank - NJWB (formerly New Jersey Environmental Infrastructure Financing Program - NJEIFP) is a partnership between the New Jersey Department of Environmental Protection (NJDEP) and the New Jersey Environmental Infrastructure Trust (Trust) to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water.	NJDEP	https://www.nj.gov/dep/dwq/mface_njeifp.htm

Program	Description	Lead Agency	Website
NJ Highlands	Highlands Regional Master Plan (RMP) grant funding for forest resource and stream corridor protection and management planning includes the identification of restoration, mitigation, and stewardship programming needs and mechanisms.	The New Jersey Highlands	https://www.highlands.state.nj.us/njhighlands/grantprograms/
New Jersey Department of Transportation (NJDOT)	Funding of the Program is typically federal through the Federal Highway Administration or State through the Transportation Trust Fund.	NJDOT	https://www.state.nj.us/transportation/business/localaid/funding.shtm
New Jersey Department of Transportation – Local Aid Program	Annually, local aid programs provide approximately $400 million in a combination of federal and state transportation trust fund funding. The Transportation Trust Fund for FY 2017 thru 2024 alone provides $310 million in state aid to municipalities and counties for local transportation improvements.	NJDOT	https://www.state.nj.us/transportation/business/localaid/funding.shtm
Morris County Open Space and Farmland Preservation Trust Fund	The Morris County Board of Chosen Freeholders established the Morris County Open Space & Farmland Preservation Trust Fund. The Preservation Trust Fund Programs include: County Park Improvement Program, Historic Preservation, Agricultural Development Board, Open Space Preservation including the Flood Mitigation Program, and Trail Construction Grant Program. The Morris County Preservation Trust can be used to acquire floodprone residential properties and serve as the local match to FEMA HMA grant funding.	Morris County	https://planning.morriscountynj.gov/divisions/prestrust/