

7.0 Hazard Mitigation

The 2011 HMP served as the basis for this Plan Update and all hazards, mitigation goals, objectives, and actions in that original plan were reviewed and, if they were still deemed to be relevant priorities, incorporated into the update. The planning process for the Plan Update encouraged the evaluation of new information, emerging issues, ideas, and actions to ensure that the plan is a living document that will be well-used by participants in the future.

7.1 Background and Past Mitigation Accomplishments

Per requirements in the Disaster Mitigation Act of 2000, a discussion regarding past mitigation activities and an evaluation of such efforts is needed to establish a foundation in developing the goals, objectives, and actions proposed in this Plan. Over the past five years, the County has displayed a pro-active approach to implementing the recommendations of the 2011 HMP.

As of 2015, 12 of the 26 actions recommended in the 2011 HMP had been implemented or were “in-progress”.

Examples of the County implementing such actions to protect its people and assets from the dangerous effects of natural hazards include:

- Orange County developed the 2011 “Orange County Single Jurisdiction Natural Hazard Mitigation Plan”. The planning process embodied in this 2018 document responds to the regulatory five-year plan update process in addition to the expansion of the plan to a multi-jurisdictional plan, including the participation of 39 of the 42 municipalities within the County.
- All but two municipalities within Orange County participate in the NFIP, which requires the adoption of FEMA floodplain mapping and certain minimum construction standards for building within a floodplain.
- Several Orange County municipalities have developed single jurisdiction and multi-jurisdiction hazard mitigation plans in recent years. For those with current or expired hazard mitigation plans, their participation in this current multi-jurisdiction hazard mitigation planning process being led by Orange County and its ultimate adoption by FEMA will maintain their eligibility for Federal mitigation grant funding.
- Using local funding, the Orange County Department of Emergency Services have installed an updated satellite radio and telephone system to aid existing and future assets in addressing the impacts of severe storms and severe winter storms.
- Also using County capital funding, the Orange County Department of Public Works replaced the Horan Bridge to mitigate future damage to the crossing and adjacent properties due to ice jams from flooding. The replacement bridge has a larger hydraulic opening to accommodate ice flows.

- The Orange County Department of Emergency Services replaced its Emergency Services Tower located in Winding Hills Park. The replaced tower will maintain communications capabilities during tornado and hurricane events.
- The Orange County Department of Public Works installed scour protection for the Farmingdale Bridge to mitigate future damage to the bridge piers and scour due to flooding.
- Several other projects that evolved from the 2011 HMP are underway or on-going. A more detailed breakdown of the status of strategies from 2011 HMP is listed in the County's jurisdictional annex.

Since the adoption of the 2011 HMP, numerous efforts have been made through the County, Town, Village, and support agencies toward reducing the impacts of disasters on the community. The 2011 HMP mitigation actions were reviewed to determine their statuses and implementation details. These actions are included in tables in each jurisdictional annex, along with their statuses (active (re-included or under development), inactive (deleted), completed) and any additional details.

7.2 Mitigation Strategy

The overall approach used to update the County and local hazard mitigation strategies are based on FEMA and NYS regulations and guidance regarding local mitigation plan development, including:

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning) and 44 CFR 201.7 (Tribal mitigation planning)
- FEMA "Local Mitigation Planning Handbook," March 2013
- FEMA "Integrating Hazard Mitigation into Local Planning," March 2013
- FEMA Mitigation Planning How-To Guide #3, Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- FEMA "Mitigation Ideas," January 2013

The mitigation strategy update approach includes the following steps that are further detailed in later subsections of this section:

- Review and update mitigation goals and objectives
- Identify mitigation capabilities and evaluate their capacity and effectiveness to mitigate and manage hazard risk
- Identify progress on previous County and local mitigation strategies
- Develop updated County and local mitigation strategies
- Prepare an implementation strategy, including the prioritization of projects and initiatives in the updated mitigation strategy

7.2.1 Mitigation Actions

Numerous mitigation actions were proposed by participating jurisdictions to reduce the impact of potential hazard events. These actions were evaluated in a public process and resulted in the identification of at least one key action to be taken by each jurisdiction to help achieve the goals outlined in the Plan Update. The proposed mitigation actions are varied, but can be grouped into six broad categories as indicated by FEMA 386-3:

- **Prevention** – Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital government programs, open space preservation, and storm water management regulations.
- **Property Protection** – Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness** – Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection** – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services** – Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects** – Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

All the mitigation actions included in this Plan Update have been reviewed by plan participants to ensure that they meet the goals of the plan. The proposed actions represent a range of projects that are well distributed throughout the six categories of mitigation. It is realized that some of the proposed actions included in this plan represent maintenance actions or post-hazard actions, which are generally not eligible for funding under FEMA's Hazard Mitigation Assistance Program. Regardless, such actions were deemed important to the community and are included in this plan. Other grants and funding sources will be sought to complete such proposed efforts.

Each jurisdictional annex provides a table identifying their prior mitigation strategy, the status of those actions and initiatives, and their disposition within their updated strategy. Additionally,

each participating jurisdiction proposed at least one implementable, pre-disaster mitigation activity to be included in this document. This information is also listed in each jurisdictional annex.

7.3 Mitigation Goals

The prime objective of setting hazard mitigation goals is to reduce or eliminate losses and damages from hazard events. It is important to create goals that are tangible. The goals identified below represent what the participants and municipalities are hoping to achieve through the implementation of this hazard mitigation plan.

The Orange County Multi-Jurisdiction Hazard Mitigation Plan Goals are broad, long-term statements of what the County will work to achieve over time through implementation of the plan. They are based on the findings of the risk assessment and they will apply to the Orange County Government and to each participating jurisdiction.

1. Promote disaster-resistant development.
2. Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3. Reduce the possibility of damages and losses to government-owned assets, including buildings, infrastructure, and protected land.
4. Reduce the possibility of damage and losses due to extreme temperatures.
5. Reduce the possibility of damage and losses due to extreme winds, tornadoes, and lightning produced in severe storms.
6. Reduce the possibility of damage and losses due to winter storms.
7. Reduce the possibility of damage and losses due to ice jams.
8. Reduce the possibility of damage and losses due to dam failures.
9. Reduce the possibility of damage and losses due to drought.
10. Reduce the possibility of damage and losses due to flooding and dam failures.
11. Reduce the possibility of damage and losses due to earthquakes.
12. Reduce the possibility of damage and losses due to landslides.
13. Reduce the possibility of damage and losses due to wildfires.

These goals were developed based on the risk assessment results, the 2011 HMP, County-wide vulnerabilities, County and jurisdiction capabilities, and overall disaster preparedness. The establishment of goals helped the jurisdictions to focus on effective and meaningful mitigation actions.

7.4 Capability Assessment

As part of the planning process for Orange County and each of its thirty-nine (39) participating jurisdictions, each participant was required to prepare a capability assessment. This capability assessment examines the ability of Orange County to implement and manage a comprehensive mitigation strategy, which includes a range of mitigation actions. The strengths, weaknesses, and resources are identified in this assessment as a means to develop an effective hazard mitigation program. According to FEMA Mitigation Planning How-To Guide #3, a capability assessment is an inventory of a community's missions, programs and policies; and an analysis of its capacity to carry them out.

The County and each participating jurisdiction identified and assessed their capabilities in the areas of: Planning and Regulatory, Administrative and Technical, and Fiscal. County and municipal capabilities in the areas of Planning and Regulatory, Administrative and Technical, and Fiscal may be found in the Capability Assessment section of their jurisdictional annexes in Section 10.0.

A summary of the various federal, state, county and local planning and regulatory, administrative and technical, and fiscal programs available to promote and support mitigation and risk reduction in Orange County are presented below.

7.4.1 Planning and Regulatory Capabilities - County and Local

Municipal Land Use Planning and Regulatory Authority

The County and municipalities have various land use planning mechanisms that can be leveraged to mitigate flooding and support natural hazard risk reduction, as shown in Table 3.3b – Jurisdictional Capability Assessment and Resource Availability in Section 3.1. These tools are valuable instruments in pre and post disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework.

Building Code

Building codes regulate construction standards and are developed for specific geographic areas of the country. They consider the type, frequency, and intensity of hazards present in the region. Structures built to applicable building codes are inherently resistant to many hazards such as strong winds, floods, and earthquakes. Due to the location specific nature of the building codes, these are very valuable tools for mitigation.

Only Orange County regulates construction through the use of a building code. The remainder of the towns, cities, and villages adhere to a building code through County authority. The authority for enforcing the building code comes from the New York State Unified Code.

Zoning Ordinance

Zoning is a useful tool to consider when developing a mitigation strategy. It can be used to restrict new development, require low-density development, and designate specific uses (e.g. recreational) in the hazard prone areas. Private property rights must be considered, but enacting a zoning ordinance can reduce or potentially eliminate damages from future hazard events.

All of the participating jurisdictions have adopted a zoning ordinance.

Subdivision Ordinance

Subdivision ordinances offer an opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided. Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events

All of the participating jurisdictions have adopted a subdivision ordinance with the exception of the Village of Unionville.

Special Purpose Ordinance

A special purpose ordinance is a form of zoning in which specific standards dependent upon the special purpose or use must be met. For example, many special purpose ordinances include basic development requirements such as setbacks and elevations. The special purpose ordinance is a useful mitigation technique particularly when implemented to reduce damages associated with flooding and coastal erosion. The only special purpose ordinance identified by any of the jurisdictions was their floodplain ordinances.

All of the participating jurisdictions have adopted special purpose ordinances with the exceptions of the Villages of Otisville and Unionville.

Site Plan Review Requirements

Site plan review requirements are used to evaluate proposed development prior to construction. An illustration of the proposed work, including its location, exact dimensions, existing and proposed buildings, and many other elements are often included in the site plan review requirements. The site plan reviews offer an opportunity to incorporate mitigation principles, such as ensuring that the proposed development is not in an identified hazard area and that appropriate setbacks are included.

All of the participating jurisdictions have adopted site plan review requirements with the exception of the Town of Greenville.

Comprehensive Plan

A comprehensive plan or a master plan is a document which illustrates the overall vision and goals of a community. It serves as a guide for the community's future and often includes anticipated demographics, land use, transportation, and actions to achieve desired goals.

Integrating mitigation concepts and policies into a comprehensive plan or master plan provides a means for implementing initiatives through legal frameworks and enhances the opportunity to reduce the risk posed by hazard events.

All of the participating jurisdictions have adopted a comprehensive or master plan with the exceptions of the Villages of Chester, Harriman, Tuxedo Park, and Unionville.

Capital Improvement Plan

Capital Improvement Plans schedule the capital spending and investments necessary for public improvements such as schools, roads, libraries, and fire services. These plans can serve as an important mechanism to reduce growth in identified hazard areas through limited public spending and can be used as a to develop a match for mitigation projects.

The Orange County Department of Parks, Orange County Department of Public Works, Village of Florida, Town of Goshen, Town of Greenville, Town of Hamptonburgh, Village of Harriman, Town of Highlands, Village of Maybrook, City of Middletown, Village of Montgomery, City of Newburgh, Town of Newburgh, Village of Otisville, City of Port Jervis, Village of Tuxedo Park, Village of Walden, Town of Warwick, and Village of Woodbury have a Capital Improvement Plan (CIP). The Town of Wallkill has a CIP in progress.

Economic Development Plan

Economic Development Plans offer a comprehensive overview of the local or regional economic state, establish policies to guide economic growth, and include strategies, projects, and initiatives to improve the economy in the future.

Furthermore, economic development plans, similar to capital improvement plans, offer an opportunity to reduce development in hazard prone areas by encouraging economic growth in areas less susceptible to hazard events.

The County of Orange, Village of Cornwall-on-Hudson, Village of Florida, Town of Goshen, Town of Greenville, Town of Hamptonburgh, Town of Highlands, Village of Maybrook, City of Middletown, Village of Monroe, Village of Montgomery, City of Newburgh, Village of Otisville, City of Port Jervis, Town of Wallkill, and Town of Warwick have an economic development plan.

Emergency Response Plan

Emergency response plans provide an opportunity for local governments to anticipate an emergency and plan the response accordingly. In the event of an emergency, a previously established emergency response plan can improve response and reduce negative effects as the responsibilities and means by which resources are deployed has been previously determined.

All participating jurisdictions have a local emergency operations plan except the Village of Chester, Town of Greenville, Village of Montgomery and Village of Unionville.

National Flood Insurance Program (NFIP)

The Federal Emergency Management Agency (FEMA), which is the government entity that administers the National Flood Insurance Program (NFIP), has mapped the known floodplains within much of the United States. When a flood study is completed for the NFIP, the information and maps are assembled into a Flood Insurance Study (FIS). A FIS compiles flood risk data for specific waters or hazard areas within specific communities and includes the main causes of flooding in these areas. The FIS delineates Special Flood Hazard Areas (SFHAs), designates flood risk zones, and establishes base flood elevations (BFEs) within certain areas. BFEs are based on the flood event that has a one percent chance of occurring annually, or the 100-year flood. At present, every individual municipality in Orange County is an active member of the NFIP except for the Village of Otisville and the Town of Woodbury (See Table 8.2a).

NFIP Community Rating System (CRS)

The Community Rating System is a voluntary incentive program that recognizes and encourages floodplain management activities at the community level. As a result of CRS participation, flood insurance premium rates are discounted to reflect the reduced flood risk that results from community actions to meet the three goals of the CRS: reduce flood loss, facilitate accurate insurance ratings, and promote flood insurance awareness (FEMA, 2016).

There are no communities in Orange County which are participants in the CRS.

Local Waterfront Revitalization Program (LWRP)

The Waterfront Revitalization of Coastal Areas and Inland Waterways Act offers local governments the opportunity to participate in the State's Coastal Management Program (CMP) on a voluntary basis by preparing and adopting a Local Waterfront Revitalization Program (LWRP), providing more detailed implementation of the State's CMP through use of such existing broad powers as zoning and site plan review. (NYS Department of State – Office of Planning & Development, No Date (2))

When an LWRP is approved by the New York State Secretary of State, State agency actions are required to be consistent with the approved LWRP to the maximum extent practicable. When the federal government concurs with the incorporation of an LWRP into the CMP, federal agency actions must be consistent with the approved addition to the CMP. Title 19 of NYCRR Part 600, 601, 602, and 603 provide the rules and regulations that implement each of the provisions of the Waterfront Revitalization of Coastal Areas and Inland Waterways Act including but not limited to the required content of an LWRP, the processes of review and approval of an LWRP, and LWRP amendments.

A Local Waterfront Revitalization Program consists of a planning document prepared by a community, and the program established to implement the plan. An LWRP may be comprehensive and address all issues that affect a community's entire waterfront, or it may address the most critical issues facing a significant portion of its waterfront.

An approved LWRP reflects community consensus and provides a clear direction for appropriate future development. It establishes a long-term partnership among local government, community-

based organizations, and the State. Also, funding to advance preparation, refinement, or implementation of Local Waterfront Revitalization Programs is available under Title 11 of the New York State Environmental Protection Fund Local Waterfront Revitalization Program (EPF LWRP) among other sources.

In addition, State permitting, funding, and direct actions must be consistent, to the maximum extent practicable, with an approved LWRP. Within the federally defined coastal area, federal agency activities are also required to be consistent with an approved LWRP. This “consistency” provision is a strong tool that helps ensure all government levels work in unison to build a stronger economy and a healthier environment.

The City of Newburgh is the only jurisdiction within Orange County with an approved LWRP.

7.4.2 Planning and Regulatory Capabilities – State and Federal

New York State Floodplain Management

There are two departments that have statutory authorities and programs that affect floodplain management at the local jurisdiction level in New York State: the New York State Department of Environmental Conservation (NYSDEC) and the Department of State’s Division of Code Enforcement and Administration (DCEA).

In 1992, the New York State Legislature amended an existing law, finding that “it is in the interests of the people of this state to provide for participation” in the NFIP (New York Laws, Environmental Conservation, Article 36). Although the Legislature recognized that “land use regulation is principally a matter of local concern” and that local governments “have the principal responsibility for enacting appropriate land use regulations,” the law requires all local governments with land use restrictions over SFHAs to comply with all NFIP requirements. The law clearly advises local governments that failure to qualify for the NFIP may result in sanctions under Federal law, and specifies that the State “will cooperate with the federal government in the enforcement of these sanctions.”

The 1992 law that provides for local government participation in the NFIP also requires state agencies to “take affirmative action to minimize flood hazards and losses in connection with state-owned and state-financed buildings, roads and other facilities, the disposition of state land and properties, the administration of state and state-assisted planning programs, and the preparation and administration of state building, sanitary and other pertinent codes.” In particular, the commissioner of the NYSDEC is to assist state agencies in several respects, including reviewing potential flood hazards at proposed construction sites.

The NYSDEC is charged with conserving, improving, and protecting the state’s natural resources and environment, and preventing, abating, and controlling water, land, and air pollution. Programs that have bearing on floodplain management are managed by the Bureau of Flood Protection and Dam Safety, which cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion, and dam failures. These objectives are accomplished through floodplain management and both structural and nonstructural means.

The Coastal Management Section works to reduce coastal erosion and storm damage to protect lives, natural resources, and properties through structural and nonstructural means. The Dam Safety Section is responsible for “reviewing repairs and modifications to dams, and assuring [sic] that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning.” The Flood Control Projects Section is responsible for reducing flood risk to life and property through construction, operation, and maintenance of flood control facilities.

The Floodplain Management Section is responsible for reducing flood risk to life and property through management of activities, such as development in flood hazard areas, and for reviewing and developing revised flood maps. The Section serves as the NFIP State Coordinating Agency and in this capacity is the liaison between FEMA and New York communities that elect to participate in the NFIP. The Section provides a wide range of technical assistance. (FEMA, 2013)

7.4.3 Administrative and Technical Capabilities – County and Local

Orange County Department of Emergency Services (OCDES) – Office of Emergency Management

The five divisions of the OCDES include Emergency Communications (911), Emergency Management, Fire Services, Police Liaison Services, and Emergency Medical Services. The OCDES is a county-chartered agency (OC CEPA, 2018). The OCDES Commissioner, whom oversees the five divisions listed above, reports to the County Executive. The Department has 66 full-time employees, 56 of which are assigned to the Division of Emergency Communications.

The Orange County Department of Emergency Services is responsible for the following County-wide services:

- Oversees emergency dispatch and communications system that allows residents to dial 911 to receive emergency medical, fire, police, or other emergency help from any phone in the County;
- Implements County Mutual Aid and Disaster Plans, which provide fire, emergency medical, and other agency assistance when local services have exceeded their local equipment and personnel resources; and
- Provides emergency medical personnel training in coordination with fire training with the NYS Office of Fire Prevention and Control.

Orange County Department of Planning (OCDP)

The Orange County Department of Planning provides leadership in the overall planning and strategy for the future development of Orange County, including the preparation of County Comprehensive Plans and the commissioning or development of other documents and studies involving transportation, agriculture, housing, resource management, open space preservation, and economic issues in general. The County acts as an administrator and monitor of federal, state and regional initiatives and programs and generally acts as a facilitator and spokesman for all

local communities. While the regulation of land use is essentially the responsibility of the individual municipalities, some regulatory measures are still carried out by the County, including overview of projects deemed referable under New York State General Municipal Law (GML) 239 l, m & n and their potential inter-municipal or County-wide impacts. Such referable projects include, but are not limited to subdivisions, area and use variances, local laws, zoning codes and other development types which meet certain criteria.

The County provides technical support in addition to decision-making advice for individual municipalities; this underscores the Planning Department's primary objective to identify common interests in County-wide matters of growth and development while providing comprehensive oversight throughout planning for future growth in the County. The County Planning Department also actively supports the Orange County Municipal Planning Federation (OCMPF), which was established in 1974 to provide educational programs and information on the purposes and techniques of municipal planning, including zoning, land use, subdivision regulation, State environmental quality review procedures, and related subjects. The OCMPF studies and recommends new and proposed legislation and existing laws, rules, and regulations concerning planning and zoning and reports findings to its members. The OCMPF also undertakes to advance the collective views and ideas of its members to foster improved techniques and methods for sound planning and zoning practices and administration.

At the local level, municipalities have a range of planning tools and regulatory mechanisms at their disposal with which can be used to influence and manage development so as to minimize damages and losses from natural hazards. (2011 Orange County HMP)

Orange County Soil & Water Conservation District (OCSWCD)

The OCSWCD is a special purpose district created to develop and carry out a program of soil, water and related natural resources conservation. Environmental planners and other OCSWCD staff provide support to the Board of Directors. The District was created in 1967 by a resolution from the County Legislature, with a mission to protect the natural resources of Orange County, particularly our soil and water. Originally, almost all of the District's work was with the agricultural community. As the county has grown and the landscape has changed over the years, our services have expanded and we now provide conservation assistance to municipalities and landowners as well as farmers. (ocsoilny.org, 2016)

Orange County Department of Public Works (OC DPW)

The Department of Public Works is responsible for planning, design, operations, maintenance, construction and general administration of the County's highways, bridges and related infrastructure; County buildings and properties; Orange County Sewer District #1 (OCSD #1), including the operation of the Sewer Plant in the Village of Harriman as well as the one in the Village of Kiryas Joel; three solid waste collection facilities located in the hamlet of New Hampton in the Town of Wawayanda and in the Cities of Newburgh and Port Jervis; the County Airport; County Commuter Parking facilities; the County motor vehicle fleets; and a variety of watershed protection and special districts.

In response to emergency situations, the full staff and resources of the Orange County Department of Public Works can be directed to respond to locations anywhere within the County, including the various Towns, Cities and Villages. (Orange County, 2016)

Orange County Department of Information Technology

The Department of Information Technology exists for the purpose of providing Orange County Government departments and agencies with the means to efficiently and effectively collect, store, manipulate and communicate County information and records.

Information Technology is comprised of a staff of computer professionals and business analysts that support all County computer technology and data information needs by identifying business problems and implementing solid cost effective solutions. Also supported are all Orange County Assessors (Towns, Villages, and Cities) and the Emergency Communications office (known as Enhanced 911).

A division of Information Technology is the Records Management Department that has a staff of record professionals who store, preserve and safeguard County inactive records for historical, legal and auditing compliance. (Orange County, 2016)

Administrative and Technical Capabilities – Local Governments

Local capabilities are discussed in their respective annexes.

7.4.4 Administrative and Technical Capabilities – State and Federal

New York State Division of Homeland Security and Emergency Services (NYS DHSES)

The NYS DHSES (formerly New York State Office of Emergency Management) is responsible for coordinating activities to protect New York's communities, the state's economic well-being, and the environment from natural, man-made and technical disasters and emergencies. DHSES routinely assists local governments, voluntary organizations, and the private sector through a variety of emergency management programs including hazard identification and mitigation, planning, training, exercises, operational response to emergencies, technical support, and disaster recovery (public) assistance. (NYS DHSES, 2011)

DHSES initiates and promotes mitigation planning and project implementation to protect lives and reduce the impact of disasters on developed land including roads, bridges and buildings in New York State. DHSES provides project management and technical assistance for planning, project identification, application development, environmental review, and benefit cost analysis. Major mitigation programs include the Hazard Mitigation Grant Program, the Flood Mitigation Assistance Program, the Pre-Disaster Mitigation Program, and the Repetitive Flood Claims and Severe Repetitive Loss Programs. DHSES also develops and maintains the State Hazard Mitigation Plan, leading a team of state, federal and academic-based partners through an on-going review and update process. (NYS DHSES, 2011)

The latest State Hazard Mitigation Plan was completed in 2014, maintaining the state's eligibility for recovery assistance from FEMA's Public Assistance. The 2014 State Hazard Mitigation Plan was also used as guidance in the development of this plan update.

New York State Department of Environmental Conservation (NYSDEC) – Division of Water – Bureau of Flood Protection and Dam Safety

The Bureau of Flood Protection and Dam Safety cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion and dam failures through floodplain management and both structural and non-structural means; and, provides support for information technology needs in the Division. (NYSDHSES, No date) The Bureau is made up of the following sections:

- Coastal Management - This Section works to reduce coastal erosion and storm damage to protect lives, natural resources, and properties through structural and non-structural means.
- Dam Safety - This Section is responsible for reviewing repairs and modifications to dams, and assuring that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning.
- Flood Control Projects - This Section is responsible for reducing flood risk to life and property through construction, operation and maintenance of flood control facilities.
- Floodplain Management - This Section is responsible for reducing flood risk to life and property through proper management of activities including, development in flood hazard areas and review and development of revised flood maps.
- Fiscal Planning and Management - This section manages FEMA grants, Bureau of Flood Protection and Dam Safety contracts, Great Lakes Restoration Initiative grants, Capital Projects, Temporary Service Contracts, WQIP contracts and office operations.

Department of State's Division of Code Enforcement and Administration (DCEA)

The Division of Building Standards and Codes (BSC) administers the mandatory statewide Uniform Fire Prevention and Building Code (Uniform Code) and State Energy Conservation Construction Code (Energy Code). The Division provides a variety of services related to the Uniform Code and Energy Code. It provides technical assistance, administers variances, delivers educational courses, oversees the enforcement practices of local governments and serves as secretariat to the State Fire Prevention and Building Code Council. The DCEA publishes technical bulletins, model reporting forms, plan review and inspection checklists, and other publications that aide local code enforcement authorities related to flood hazard areas and reducing flood losses.

7.4.5 Fiscal Capabilities – County and Local

Municipal Fiscal Capabilities

Jurisdictions in Orange County have the ability to implement mitigation activities through existing local budgets, local appropriations via referendums or bonding, and – when available through several state and federal loan and grant funding opportunities. In the current municipal fiscal climate of budgetary constraints and tax caps, it is important for local jurisdictions to creatively address mitigation strategies leveraging inter-municipal cooperation and shared services in both grant applications and locally-financed projects. This includes collaborating with Orange County departments and staff.

7.4.6 Fiscal Capabilities – State and Federal

New York Rising Community Reconstruction Program

The NY Rising Community Reconstruction program was established to provide additional rebuilding and revitalization assistance to communities severely damaged by Hurricanes Sandy and Irene and Tropical Storm Lee. The NY Rising Community Reconstruction program enables communities to identify resilient and innovative reconstruction projects and other needed actions based on community-driven plans that consider current damage, future threats and the communities' economic opportunities. Communities successfully completing a recovery plan will be eligible to receive funds to support the implementation of projects and activities identified in the plans. (NYS GOSR, 2013)

Each NY Rising Community has a Planning Committee that includes, among others, a representative from the County, Town or Village, elected legislative representatives, local residents, and leaders of other organizations and businesses in the community. The Planning Committee will take the lead in developing the content of the plan. The State has provided each NY Rising Community with a planning team to help prepare a plan.

Consultants have been hired through a State process administered by New York State Homes and Community Renewal (NYS HCR) through its Office of Community Renewal (OCR) and the Housing Trust Fund Corporation (HTFC). Planning experts from the Department of State and Department of Transportation have been assigned to each community to provide assistance to the community and help oversee the planning consultants.

The City of Middletown and Village of Washingtonville are designated NY Rising Communities, both eligible for between \$3 million and \$25 million in Community Development Block Grant (CDBG) Program funding. Such funding will be implemented to bolster economic development, civic infrastructure, hazard mitigation efforts, and further community development planning reports, plans, and studies.

Federal Hazard Mitigation Funding Opportunities

Hazard mitigation funding from the federal government is available to all municipalities with a current and FEMA-approved hazard mitigation plan. This plan, the 2018 Orange County Multi-Jurisdictional Hazard Mitigation Plan Update, will be the current plan for the County and the thirty-nine (39) participating jurisdictions when it is approved by FEMA and adopted locally.

Grant programs from FEMA are available but usually require local share funding percentages – 10% to 25% of the total project costs will need to be provided by the applicant while the awarding grant program will fund 75% to 90%. Hazard mitigation grant programs sponsored by FEMA are described below:

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) can provide grants to State and local governments after a disaster has been declared. These grants provide funds to assist with the cost of mitigation measures like strengthening buildings to withstand earthquakes or raising furnaces, storage areas, or entire buildings above flood elevations. Hazard mitigation refers to measures that protect lives and property from future damages caused by natural disasters. In the long term, mitigation measures reduce personal loss, save lives, and reduce the future difficulty and cost of responding to and recovering from disasters. (FEMA, 1999)

Examples of types of mitigation measures eligible for HMGP funding include:

- Acquisition of real property in high hazard areas, demolition or relocation of structures, and conversion of land to open space use.
- Strengthening existing structures against high winds.
- Seismic rehabilitation and structural improvements to existing structures.
- Elevation of flood-prone structures.
- Implementing vegetation management programs to reduce wildfire hazard to high-risk structures.

Individuals can work with their communities to identify potential mitigation measures. The communities in a declared State can apply for HMGP funding for these measures from the State. The State is responsible for selecting and prioritizing local projects and then forwarding selected applications to FEMA for approval. The amount of funding available for the HMGP under a disaster declaration is 15 percent of FEMA's estimated total grants for all other categories of assistance from that disaster. The State sets funding priorities and allocates funds among communities. The HMGP can provide grants to assist with 75 percent of the total cost of mitigation projects. Once a project is approved, the State and local community are responsible for implementing it and providing a 25 percent funding match. This match is from State and local sources. (FEMA, 1999)

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) grant program provides funding to States, Federally-recognized Indian tribal governments, and communities so that cost-effective measures are taken to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the National Flood Insurance Program (NFIP). The long-term goal of FMA is to reduce or eliminate claims under the NFIP through mitigation activities. Three types of grants are available under FMA: Planning, Project, and Technical Assistance. (FEMA, 2007 (2))

This program is funded on an annual basis and no federal disaster declaration is required for eligibility. Only NFIP-insured homes and businesses, however, are eligible for mitigation projects. Individuals must apply via local governments or other eligible organizations. Applicant municipalities must have a FEMA-approved local flood mitigation plan. The FMA program funds 75 percent of the total project cost while the remaining 25 percent must come from non-federal sources.

Pre-Disaster Mitigation Program

The goal of the Pre-Disaster Mitigation Grant Program is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis. The program requires a 25 percent local share and no disaster declaration is required. As with the HMGP and FMA programs, a FEMA-approved local hazard mitigation plan is required.

Federal and State Disaster and Recovery Assistance Programs

Disaster recovery funding is available from local, state, and federal levels in the aftermath of a disaster. The extent and severity of the disaster dictates the variety and quantities of funding available in a given event. According to the 2014 NYS Hazard Mitigation Plan, the following general types of funding assistance may be available following a major disaster:

- Public Assistance (PA) Grant Program;
- Individual Assistance (IA) Grant Program;
- Community Development Block Grant (CDBG) – Department of Housing and Urban Development; and
- Federal Highway Administration – Emergency Relief Program.

Additional sources of funding from the state and federal levels may be sought from the following programs:

- Social Services Block Grant (NYS)
- Homeland Security Grant Program (NYS)

- U.S. Economic Development Administration
- Homeownership Repair and Rebuilding Fund – HRRF (NYS)
- Empire State Relief Fund (NYS)
- Governor’s Office of Storm Recovery – GOSR (NYS)
- Empire State Development (NYS)

7.5 Mitigation Strategy Prioritization

7.5.1 Mitigation Strategy

There are many factors that must be considered when implementing a mitigation action or project. Action listings in each jurisdictional annex contain specific implementation details associated with each proposed action including goals achieved, implementing agency(ies), estimated costs, possible funding sources, and implementation timeframes.

When detailed costs were not available, estimated price ranges were considered for each mitigation action. The levels for the cost estimates are as follows:

- **Low:** cost is estimated to be below \$10,000
- **Medium:** cost is estimated to be between \$10,000 and \$100,000
- **High:** cost is estimated to be over \$100,000

The implementation timeframes provided for each mitigation action are also estimated. Smaller, locally-funded projects are easier to implement and therefore have shorter timeframes, while larger, complicated actions that involve funding applications, agency reviews, etc., will likely take five years or longer to complete. The levels for the timeframe estimates for each mitigation action are as follows:

- **Short:** completion anticipated within 1-2 years
- **Moderate:** completion anticipated within 5 years
- **Long:** completion anticipated in greater than 5 years
- **Ongoing:** action involves continued coordination or effort

For some mitigation actions, timeframe is presented as a range. This indicates that the action is currently being implemented or should be implemented as soon as possible and that it will continue for an extended period of time.

7.5.2 Action Prioritization

A cost-benefit analysis was completed for each proposed mitigation action as a way to prioritize the many actions included in this document. The priority level indicated for each action is based on the current knowledge of the mitigation actions, including their estimated costs, timeframes, and funding availability. Prioritization criteria will continue to be reviewed and revised on an

annual basis during the five-year plan update timeframe. By implementing the proposed actions as part of pre-disaster mitigation, and not as an afterthought, the implementation will be more cost effective and the incorporation of these actions into normal planning processes and operational procedures will naturally occur.

Each proposed mitigation action was evaluated against the following considerations (FEMA, 2008):

- Compatibility with goals and objectives identified in the 2014 NYS Hazard Mitigation Plan;
- Compatibility with goals of the plan update;
- Assessment of the impact of identified actions on jurisdictions within the entire planning area or region;
- Cost/benefit reviews of potential actions;
- Funding priorities identified in the current NYS Hazard Mitigation Plan; and
- Compatibility with other local and regional plans and programs.

Each participating jurisdiction evaluated the mitigation actions that applied to their jurisdiction using the “STAPLEE” chart worksheet for guidance². These evaluations considered the six elements addressed above. This exercise provided the participating jurisdictions with a way to prioritize the mitigation actions using a simple cost/benefit analysis (Table 7.5a). Depending on the results of the action evaluations, each mitigation action is recognized as a high priority project, medium priority project, or low priority project.

Table 7.5a: Benefit and Cost Prioritization Rankings			
	Assessment Levels and Description		
	High	Medium	Low
Benefits	Action within the next five years is important and is anticipated to have a meaningful impact on reduction of losses.	A long-term impact on the reduction of losses is anticipated. Action within the next five years is anticipated, though not critical.	It is difficult to assess the benefits of an action due to its long-term timeframe. Action within the next five year is unlikely.
Costs	Existing funding sources are inadequate or are not identified to cover implementation of the action.	Funding exists, but will have to be reapportioned or budgeted over multiple years.	Funds to implement action are available in existing budget.

Actions recorded as having a benefit level equal to or higher than the cost level, were viewed as cost-beneficial actions, therefore receiving a high priority ranking. This priority ranking process should be viewed as a preliminary analysis. The ranking system used during this evaluation will evolve based on input from participating jurisdictions, agency representatives, and other

² “STAPLEE” refers to the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental.

branches of state and federal government as the implementation of mitigation strategies progresses. Additional funding sources will be required for many of the proposed mitigation actions. Coordination with agencies such as NYSDHSES and FEMA will be necessary to secure funds for proposed mitigation actions, especially those with high costs and long-term implementation schedules.

Tables in each jurisdictional annex list the highest priority multi-jurisdictional actions being proposed as part of this HMP Update. The plan update project team identified these actions as those with most importance for implementation in the next five years. This list reflects the re-inclusion of some actions from the original plan that are still relevant, but also incorporates many new actions that would also minimize potential impacts to life and property as a result of hazard events. This list represents mitigation actions that were proposed by participating jurisdictions, agencies, and members of the public, based on need. Some of the proposed actions relate to a specific type of hazard event or specific jurisdiction, while others are proposed to mitigate an array of hazards or will apply to multiple jurisdictions.

7.5.3 Additional NYS DHSES Mitigation Action Requirements

As required by NYS DHSES, Orange County and its participating jurisdictions in this plan analyzed their critical facilities located within the 500-year floodplain and ensured that proposed mitigation actions addressed the vulnerability of such facilities. The name, location, and associated mitigation action of each critical facility located within the 500-year floodplain in each participating jurisdiction can be found in tables in each of their respective annexes in Section 10.

Each critical facility listed above has an associated mitigation action with the exception of the Danskammer Power Plant and the Roseton Generating Station located, both located in the Town of Newburgh. The Danskammer coal-fired electricity-generating facility is owned by a private equity firm known as Danskammer Holdings, LLC – a subsidiary of Tiger Infrastructure and Agate Power. The Roseton facility is owned by Castleton Commodities International, LLC (CCI). These facilities are regulated and permitted by the NYS Public Service Commission and operates beyond the jurisdiction of the Town of Newburgh or Orange County. However, the Town of Newburgh and Orange County will pursue on-going consultation with the operators of both Danskammer and Roseton to ensure that local officials understand the risks and the operators' response plans should a disaster occur.

Given the for-profit and regional utility nature of these facilities, the County has requested that New York State consider whether they would benefit from future mitigation actions in the State Hazard Mitigation Plan.

Plans developed with NYS DHSES-administered funds also require that following are identified: potential sites for the placement of temporary housing units to house residents displaced by disaster; sites suitable for the relocation or construction of houses once floodplain properties are razed; and any pre-disaster actions needed to make such sites viable.

Orange County has preliminarily identified a clutch of potentially appropriate sites that meet FEMA's conditions for the placement of trailers/temporary housing in the event of a disaster. However, given that the locations of hazard events are difficult to precisely predict and that these sites are currently in private ownership, the County will keep the addresses of these sites anonymous. While it is likely that, should the need and time arise, the owners of the highest priority centrally-located site would come to a usage agreement with the County, the County would like to avoid listing the location of this site at present. The County will determine exact future locations for FEMA trailers/temporary housing based on the type, severity, location, and nature of particular disasters that warrant such a need at the appropriate time.

A further NYS DHSES-administered funds requirement is to identify evacuation routes and shelters along with any pre-disaster mitigation actions required to make them viable. Regarding evacuation routes, the Orange County Office of Emergency Management has identified that major interstate highways and state highways will be the first priority roads for evacuation routes, assuming they are not compromised by the particular disaster itself. These routes include I-87, I-84, NY- 17 (future I-86), NY-9W, and NY-209 among others. The Orange County Transportation Facilities Map is located in Section 2.7. Regarding emergency shelters, each participating jurisdiction in this plan update completed a brief emergency shelter questionnaire or included the establishment of such a facility as a proposed mitigation action. These forms can be found in Attachment III of the annexes of each participating jurisdiction in Section 10.