Section 6. Mitigation Strategies

This section presents mitigation actions for Dutchess County to reduce potential exposure and losses identified as concerns in the Risk Assessment portion of this plan. The Steering Committee and municipal planning partnership reviewed the risk assessment to identify and develop these mitigation actions, which are presented herein.

This section includes:

1. Background and Past Mitigation Accomplishments
2. Overview of Mitigation Strategy Development
3. Review and Update of Mitigation Goals and Objectives
4. Capability Assessment
5. Review and Update of Mitigation Strategies
6. Mitigation Strategy Prioritization, including Review of Cost-Effectiveness

Hazard mitigation reduces the potential impacts of, and costs associated with, emergency and disaster-related events. Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

Mitigation actions can include activities such as: revisions to land-use planning, training and education, and structural and nonstructural safety measures.

6.1 Background and Past Mitigation Accomplishments

In accordance with the requirements of the Disaster Mitigation Act of 2000 (refer to Page 1-1 for more detail on DMA 2000), a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this Plan. The county and participating municipalities, through previous and ongoing hazard mitigation activities, has demonstrated that it is pro-active in protecting its physical assets and citizens against losses from natural hazards. Examples of previous and ongoing actions and projects include the following:

- The County facilitated the development of the original 2006 Dutchess County Hazard Mitigation Plan (single jurisdiction plan). The current planning process represents the regulatory five-year plan update process as well as expansion of the plan to a multi-jurisdictional plan, including participation of all municipalities in the County and key county and regional stakeholders.
- All of the municipalities participating in this Plan participate in the NFIP, which requires the adoption of FEMA floodplain mapping and certain minimum construction standards for building within the floodplain.
- A number of Dutchess County municipalities have developed single- and multi-jurisdictional local hazard mitigation plans. For those municipalities with current or expired HMPs, their participation in this planning process and adoption upon FEMA approval of this plain will continue their eligibility for Federal mitigation grant funding.
- The County, in partnership with the County Soil and Water Conservation District, hosts workshops annually covering stormwater management issues, including measures to reduce stormwater volume and protect property. The workshops attract local municipal officials and staff as well as professional designers and engineers. As part of this planning process the County offered an NFIP and CRS workshop to build local understanding of the NFIP, NFIP reform, and options to manage flood insurance rate increases.
- Several committees have been established within the county and region to support flood mitigation and watershed improvements including the Wappingers Intermunicipal Council.

- Numerous studies have been conducted by federal, state, and local agencies/entities to examine natural hazards affecting Dutchess County, and such studies have been reviewed and incorporated into this plan update as appropriate.
- Many municipalities in Dutchess County have adopted regulatory standards regarding land-use and zoning that exceed minimum requirements and provide the communities with greater capability to manage development without increasing hazard risk and vulnerability. Examples of these standards are presented in the Capability Assessment subsection later in this chapter.
- Municipalities have actively participated in available mitigation grant funding opportunities to implement mitigation projects, as identified in their jurisdictional annexes in Chapter 9.

6.2 General Mitigation Planning Approach

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

6.3 Review and Update of Mitigation Goals and Objectives

This section documents the efforts to develop hazard mitigation goals and objectives established to reduce or avoid long-term vulnerabilities to the identified hazards.

6.3.1 Goals and Objectives

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." The mitigation goals have been developed based on the risk assessment results, discussions, research, and input from amongst the committee, existing authorities, polices, programs, resources, stakeholders and the public.

For the purposes of this plan, goals are defined as follows:

Goals are general guidelines that explain what is to be achieved. They are usually broad, long-term, policy-type statements and represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

The hazard mitigation goals for Dutchess County and municipalities included in the plan were developed based in part on a review of the hazard mitigation goals and objectives established in the NYS HMP, the 2006 Dutchess County HMP, as well as the current or expired municipal hazard mitigation plans within the county. Further, these goals were selected to be compatible with the needs and goals expressed in other available County and local community planning documents. Achievement of these goals helps to define the effectiveness of a mitigation strategy.

FEMA defines ***Goals*** as general guidelines that explain what should be achieved. Goals are usually broad, long-term, policy statements, and represent a global vision.

FEMA defines ***Objectives*** as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible.

FEMA defines ***Mitigation Actions*** as specific actions that help to achieve the mitigation goals and objectives.

Table 6-1. Dutchess County Hazard Mitigation Plan Goals

Goal Number	Goal Statement
G-1	Protect public health and safety.
G-2	Protect property, including public and private property, critical facilities and infrastructure. (Modified from NYS 2014 HMP – Goal 2)
G-3	Increase education and awareness, and promote relationships with stakeholders, citizens, government officials, and property owners to develop opportunities for mitigation of natural hazards. (Modified from NYS 2014 HMP – Goal 3)
G-4	Encourage the development and implementation of long-term, cost-effective, environmentally sound, and resilient mitigation projects to preserve or restore the functions of natural systems. (NYS 2014 HMP – Goal 4)
G-5	Build regional, county and local mitigation and related emergency management capabilities.
G-6	Promote Local and Regional Sustainability
G-7	Support comprehensive county and local mitigation through the integration of hazard mitigation planning into related county and local plans and programs

6.4 Capability Assessment

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. This assessment is an integral part of the planning process. The assessment process enables identification, review and analysis of local and state programs, policies, regulations, funding and practices currently in place that may either facilitate or hinder mitigation.

During the original planning process, the County and participating municipalities identified and assessed their capabilities in the areas of: Planning and Regulatory, Administrative and Technical, and Fiscal. By completing this assessment, the Planning Committee and each jurisdiction learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Limitations that may exist on undertaking actions;
- The range of local and/or state administrative, programmatic, regulatory, financial and technical resources available to assist in implementing their mitigation actions;

- Action is currently outside the scope of capabilities;
- Types of mitigation actions that may be technically, legally (regulatory) administratively, politically or fiscally challenging or infeasible;
- Opportunities to enhance local capabilities to support long term mitigation and risk reduction.

During the 2015 planning process, all participating jurisdictions were tasked with developing or updating their capability assessment, paying particular attention to evaluating the effectiveness of these capabilities in supporting hazard mitigation, and identifying opportunities to enhance local capabilities.

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 9. Within each annex, participating jurisdictions have identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities"), and how they intend to promote this integration ("integration actions"). A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7.

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 Dutchess County are presented below.

6.4.1 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.

The municipalities have significant individual capacities to protect stream corridors. Zoning can include minimum stream setback requirements and many communities require that sensitive lands be subtracted in lot yield calculations. The Town of Pleasant Valley has a specific zoning district regarding floodplains, which identifies that "uses in the floodplain district should be generally limited to agriculture, forestry, recreation, and other uses that would be minimally affected by high water. Structures that would house either humans or livestock should be sited elsewhere."

The Dutchess County Department of Planning and Development helps to maintain and enhance the County's quality of life through the analysis of development alternatives and selection of the most beneficial courses of action. Dutchess County created Greenway Connections, a highly-illustrated, easy-to-use sourcebook of inspiring ideas, how-to guidelines, and case study examples that are designed to help local officials and citizen groups make better decisions on improving our surroundings.

According to State Law, certain applications to local boards must also be circulated to the Department of Planning and Development for review and comment (called "Referrals"). The County reviews these actions to bring inter-community and countywide considerations to the attention of municipal boards. Comments by county planners help shape the future of Dutchess County and guide the actions of an individual village, town, or city. The zoning referral process is used to ensure consistency with the concerns of the County, its Master Plan, "Directions: The Plan for Dutchess County and Greenway Connections".

While conducting its review, the County looks across geographical and political boundaries to protect the environment and economy of Dutchess County. The County turns to the municipality's Master Plan to see if the applications are addressing the long-term needs and desires of the community.

The Dutchess County Planning Federation supports the efforts of local volunteers involved in the community planning process throughout the County. The Federation, in partnership with the Dutchess County Department of Planning and Development, has presented educational workshops to local officials and residents for over 20 years. This cooperative effort also produces a monthly educational eNewsletter, *Plan On It,* which reaches over 1,200 email subscribers. The Federation is governed by a Board elected by members at the annual meeting.

The County has developed the following plans and resources to support countywide land-use planning and natural hazard risk management:

Greenway Connections (2000): Dutchess County created Greenway Connections, a highly-illustrated, easy-to-use sourcebook of inspiring ideas, how-to guidelines, and case study examples that are designed to help local officials and citizen groups make better decisions on improving our surroundings. It also describes the types of projects that are eligible for Greenway funding. The Guides offer detailed recommendations on a variety of current planning topics, from retrofitting commercial strips, saving farmland, designing conservation subdivisions, and creating walkable centers, to site specifics on signs, parking, lighting, and landscaping. There also specific guides which address Stream Corridor Protection, Wellhead and Aquifer Protection and Green Infrastructure**.**

Center and Greenspaces (2003): Dutchess County has introduced a Centers and Greenspaces guide as part of the Greenway Compact program. Consistent with historic Hudson Valley landscape patterns, the guide specifically defines smart growth in terms of locating new development in or immediately around existing or emerging centers, either strengthening existing cities, villages, and hamlets or transforming suburban strips or subdivisions into more walkable, mixed-use centers. The Centers and Greenspaces initiative attempts to redesign the spread-out patterns of the last 60 years, which generally feature separated land uses, over-reliance on automobiles, and fragmentation of the natural environment.

***Five-Year Consolidated Plan(2013-17)/Annual Action Plan (2015)*:** This Plan helps to identify the housing needs and how to allocate funding from the Community Block Grant program and other sources to better improve the quality of life for its residents. Overall, the Plan seeks to improve living standards for its residents, especially at need populations, improve or construct public facilities, improve the standards of public infrastructure, including water and sewer system improvements and roadway improvements, and to support vital public services for the elderly, homeless and special needs population.

Moving Dutchess (2012): The fifth long-range, Metropolitan Transportation Plan of the Poughkeepsie-Dutchess County Transportation Council. The purpose and intent of the plan to identify policies and projects that will maintain and prepare the existing and future transportation system to meet the mobility challenges in the coming decades. As Dutchess County has changed over the past thirty years, the Council, as an organization and through its policies, has adapted to meet new challenges, while still adhering to its core transportation mission: To provide the resources (funding) and tools (planning) necessary to build and maintain a transportation system that promotes the safe and efficient movement of people and goods in a sustainable manner.

One of the four main principals established for the development of the plan was that it be sustainable: *Moving Dutchess will establish an environmentally and fiscally sustainable way forward to meet our*

future transportation challenges, with the intent of creating livable communities that improve our quality of life.

The plan also includes a chapter on Natural Resources and identifies wetlands, floodplains, and steep slopes as areas of concern for development. It also addresses the results of Tropical Storm Irene (2011) and identified 13 areas that were most impacted by the storm and in need of future infrastructure projects.

Dutchess County Natural Resources Inventory (2010): A tool that is available to local municipal officials to help guide land use decisions and allow the community to consider innovative tools for natural resource protection.

National Flood Insurance Program (NFIP)

The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 (FEMA's 2002 National Flood Insurance Program (NFIP): Program Description). The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Please refer to Section 5.4.5 for information on recent legislation related to reforms to the NFIP.

There are three components to the NFIP: flood insurance, floodplain management and flood hazard mapping. Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary. Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage in the U.S. is reduced by nearly $1 billion each year through communities implementing sound floodplain management requirements and property owners purchasing flood insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80% less damage annually than those not built in compliance (FEMA, 2008).

All municipalities in Dutchess County actively participate in the NFIP. As of January 31, 2015, there were 1,860 NFIP policyholders in Dutchess County. There have been 498 claims closed to date, totaling nearly $11 million for damages to structures and contents. There are 58 NFIP Repetitive Loss (RL) properties, and 13 NFIP Severe Repetitive Loss (SRL) properties in the county. Further details on the flood vulnerability within the county may be found in the flood hazard profile in Section 5.

Municipal participation in and compliance with the NFIP is supported at the federal level by FEMA Region II and the Insurance Services Organization (ISO), at the state-level by the New York State Department of Environmental Conservation (NYSDEC) and New York State Office of Emergency Management (NYS DHSES). Additional information on the NFIP program and its implementation throughout the county may be found in the flood hazard profile (Section 5).

The state and municipalities within it may adopt higher regulatory standards when implementing the provisions of the NFIP. Specifically identified are the following:

Freeboard: By law, NYS requires Base Flood Elevation plus 2 feet (BFE+2) for all single- and two-family residential construction, and BFE+1 for all other types of construction. Communities may go beyond this requirement, providing for additional freeboard or requiring BFE+2 for all types of construction. A number of Dutchess municipalities have supported property owners meeting and exceeding freeboard requirements through the site plan review and zoning board of approvals process; for instance, allowing overall structure heights to be determined from BFE+2 rather than grade within NFIP floodplains.

Cumulative Substantial Improvements/Damages: The NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements. Over the years, a community may issue a succession of permits for different repairs or improvement to the same structures. This can greatly increase the overall flood damage potential for structures within a community. The community may wish to deem "substantial improvement" cumulatively so that once a threshold of improvement within a certain length of time is reached, the structure is considered to be substantially improved and must meet flood protection requirements.

NFIP Community Rating System (CRS)

As an additional component of the NFIP, the Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance (FEMA, 2012). Municipalities and the county as a whole could expect significant cost savings on premiums if enrolled in the CRS program.

Currently the Town of East Fishkill is the only community in Dutchess County participating in the CRS program. The Town holds a Class 8 rating, resulting in a 10 percent discount on flood insurance.

As part of the plan update process, the County sponsored an NFIP, NFIP Reform and CRS informational workshop for all plan participants in July, 2015 which was well attended. Subsequent to the workshop, several communities participated in a municipal floodplain administration program evaluation exercise designed to help communities understand their floodplain management program's strengths and weaknesses, and identify areas of improvement which may be included in their updated mitigation strategies.

Local Waterfront Revitalization Program

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) (pdf) 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. 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. To date, the City of Beacon, Town of Poughkeepsie, Town of Red Hook, Town of Rhinebeck, and the Village of Tivoli have State-approved LWRPs, while the City of Poughkeepsie has an unofficial LWRP.

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 LWRP follows a step-by-step process by which a community can advance community planning from a vision to implementation, which is described in the Making the Most of Your Waterfront Guidebook (pdf) developed by the Department of State. Additionally, the Opportunities Waiting to Happen Guidebook (pdf), developed by

the Department of State, provides help to assist all New Yorkers to redevelop abandoned buildings as part of the overall vision for their community.

In addition to landward development, water uses are subject to an ever-increasing array of use conflicts. These include conflicts between passive and active types of recreation, between commercial and recreational uses, and between all uses and the natural resources of a harbor. Increases in recreational boating, changes in waterfront uses, coastal hazards what to do with dredged materials, competition for space, climate change, and multiple regulating authorities, all make effective harbor management complex. These conflicts and a lack of clear authority to solve them have resulted in degraded natural and cultural characteristics of many harbors, and their ability to support a range of appropriate uses. As part of an LWRP, a harbor management plan can be used to analyze and resolve these conflicts and issues.

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.

Currently the City of Beacon, the Towns of Poughkeepsie, Red Hook, Rhinebeck and Tivoli, and the Village of Tivoli have active LWRPs. The City of Poughkeepsie has an LWRP that is pending State approval.

6.4.2 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.

6.4.3 Administrative and Technical Capabilities - County and Local

Dutchess County Department of Emergency Response (DCDER)

The mission of the DCDER is "To assist the Emergency First Responders of Dutchess County and local municipalities to prepare and respond to natural and man-made emergencies in their communities." Guidance is provided through established protocols such as Dutchess County's Comprehensive Emergency Management Plan and the Fire and Emergency Medical Services (EMS) Mutual Aid Plans.

Sheltering and Evacuation:

The DCDER maintains general and seasonal preparedness information on their Emergency Response webpages. The County Emergency Management Office and the Department of Health continue to advise residents through the "Be Prepared" campaign. The Storm Preparedness and Emergency Preparedness sections of their website includes a section on Evacuation. The DCDER works along with American Red Cross in establishing, maintaining, and opening shelters in the event of an emergency or disaster.

Through various outreach channels, the County and DCDER provide the public with specific information on evacuations and sheltering on an event-specific basis. These outreach channel include:

- DCDER Homepage: http://www.co.dutchess.ny.us/CountyGov/EmergencyServicesIndex.htm
- Calling 2-1-1 for information on warming centers and shelter operations
- County social media pages:
- Facebook at https://www.facebook.com/pages/Dutchess-County-Government/73646813346
- Twitter at http://twitter.com/#!/DutchessCoGov

The County has identified a number of mitigation actions within their County annex (Section 9.1) that will improve county-wide emergency management capabilities, including evacuation and sheltering, as follows:

- DPW-3: *Back-Up Power for County Critical Facilities- Dutchess County Farm and Home Center Emergency Shelter*
- DPW-5: *Scour-Critical Bridge Improvements*
- DER-5: *Upgrades to Farm and Home Center; supporting county sheltering needs*
- SWCD-7: *Dutchess Enhanced Flood Warning System*
- SWCD-8: *Enhanced Rain Weather Detection System*

Dutchess County Department of Planning and Development (DCDPD)

The Department of Planning and Development helps to maintain and enhance the County's quality of life. The Department is responsible for countywide planning, coordination of economic development activities, planning assistance to local governments, and comprehensive mapping and geographic information systems (GIS) data.

Planning Section responsibilities range from countywide planning to assistance to municipalities on development-related issues, conducted through the analysis of development alternatives and selection of the most beneficial courses of action. Guided by the County plans, i.e., Greenway Connections and Directions, the ultimate objective of the Planning Department is to maintain and enhance the County's quality of life and economic climate. Greenway Connections provides an overall guide for development actions, as well as the standards and policies by which to judge applications. It is a working document, endorsed by nearly every municipality in Dutchess County, and it should be consulted continually by decision makers in land use management.

Dutchess County Soil & Water Conservation District (DCSWCD)

The DC SWCD focuses on natural resource problems and solutions. The District provides technical assistance as well as education on soil, water and related natural resources. Municipalities, farmers and landowners use this information in making proper land use decisions. In addition, the District assists other environmental organizations in the expansion of public service.

Relevant to natural hazard mitigation, the District provides services and technical assistance in the areas of:

- Floodplain and wetland determination
- Municipal development reviews
- Agriculture Environmental Management (AEM)
- Community Environmental Management (CEM)
- Department of Environmental Conservation (DEC) permit filing
- Dry hydrant (fire protection)
- Pond, stream, and wetland management
- Whole Farm Plans
- Watershed management

Dutchess County Department of Public Works (DCDPW)

The Department of Public Works has the responsibility for the administration, construction, maintenance, supervision, repair, alteration, and care of the airport, and all buildings, highways, bridges, parking lots, county parks, as well as the Division of Public Transit, and all other Public Works' facilities considered within the county jurisdiction. The department is also responsible for the supervision of the design and construction of all capital projects in the county five-year Capital Improvement Program.

The following divisions of the DPW have active roles in hazard mitigation and natural hazard risk reduction throughout the County:

Engineering Division:

The Engineering Division's primary mission is to oversee the safety and functionality of Dutchess County's 396 miles of highway, 140 bridges and 178 large drainage structures. The Division oversees the design, construction and inspection of all county highway and bridge improvement projects.

Many of these projects are eligible for 80% federal reimbursement and the Division is responsible for progressing these projects through the involved Federal highway process required to receive these funds. The Division works with DPW's HCM Division to monitor the condition of the County's Highway System, identify the need for improvement or maintenance projects, scopes these projects and estimates their cost and then pursues funding to implement these projects.

The Engineering Division is also responsible for providing engineering support services for the other divisions of DPW.

Highway Division:

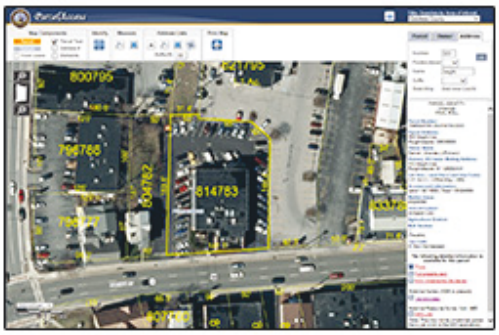
The Highway Division is responsible for overseeing numerous programs to maintain the county's 395 miles of roads, 140 bridges and 178 drainage structures. This division has a pavement maintenance and rehabilitation program that includes reclaiming, overlays, nova chip, oil and stone and crack sealing. Roadside maintenance includes pipe installation, guide rail installation, shoulder and drainage ditch maintenance, tree and brush clearing and grass cutting.

Six highway facilities conduct snow and ice control, repair and install all warning and regulatory signs on county roads and are responsible for some bridge repairs. The division also provides accounting services for over $15 million in operating funds, Consolidated Highway Improvement Program (CHIPS) monies, and various other State and Local funds.

Parks Division: Placeholder.

Dutchess County GIS

Dutchess County is committed to connecting the public to important geographically based information by maintaining geographic data and databases; and then giving the public access to these with powerful web mapping applications on the Internet.



ParcelAccess - Map-based parcel lines and property information. A searchable map with all Dutchess County property boundaries and extensive amount of current property information are made available to users. Pertinent information such as wetlands, flood zones and elevations are also presented to help describe properties.

Wappingers Creek Watershed Intermunicipal Council (WIC):

Per the WIC website: In 1995 the Dutchess County Water Quality Strategy Committee (DCWQSC) formed the Wappinger Creek Watershed Planning Committee (WCWPC) to address problems in specific to the Wappinger Creek Watershed. An in-depth water quality study was conducted from summer 1997 to spring 2000. While conducting these studies, over a 5-year period the Wappinger Creek Watershed Management Plan (WCWMP)

was developed. In 2000 the Wappinger Creek Intermunicipal Council (WIC) was formed to facilitate communication and ease completion of cooperative projects in order to implement the management plan. This council primarily consists of municipal officials and their representatives from the 13 municipalities within the Wappinger Creek watershed. The Mission of the WIC is to cooperatively address common issues that may affect the quality of the watershed.

The WIC Goals for the Period 2007-2010, as relevant to hazard mitigation and natural hazard risk reduction, include:

- Protect Streamside Buffer Zones: It is our intent that all municipalities in the watershed will protect forested streamside buffer zones by ordinance, zoning, and/or incentives. Model ordinances can be provided to WIC members for guidance. These forested buffers will help filter pollutants from the water, moderate flooding, stabilize stream banks, and create habitats for wildlife;
- Conducting Stream Assessments, Cleanup Projects, and/or Re-vegetation Projects: It is our intent that each year WIC members and volunteers will work to assess a tributary or a portion of the Wappinger Creek. This will increase public awareness of watershed issues and help to identify problem areas which can then be rehabilitated or re-vegetated as needed;
- Public Education and Outreach: It is our intent that WIC members will work with CCEDC, DCSWCD, and other organizations as appropriate to develop and implement a systematic education and outreach campaign about watershed issues in Dutchess County, reaching CACs, municipal officials, and the public (including youth); and
- Meeting Regularly to Share Information: WIC members agree to meet regularly in order to share information, facilitate cooperation, and celebrate successes in protecting the Wappinger Creek Watershed.

6.4.4 Administrative and Technical Capabilities - State and Federal

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

For more than 50 years, NYS DHSES (formerly New York State Office of Emergency Management – NYS DHSES) and its predecessor agencies have been responsible for coordinating the activities of all State agencies to protect New York's communities, the State's economic well-being, and the environment from natural and man-made disasters and emergencies. NYS DHSES routinely assists local governments, voluntary organizations, and private industry through a variety of emergency management programs including hazard identification, loss prevention, planning, training, operational response to emergencies, technical support, and disaster recovery assistance.

NYS DHSES administers the FEMA mitigation grant programs in the state, and supports local mitigation planning in addition to developing and routinely updating the State Hazard Mitigation Plan. NYS DHSES prepared the current State Hazard Mitigation Plan working with input from other State agencies, authorities and organizations. It was approved by FEMA in 2014 and it keeps New York eligible for recovery assistance in all Public Assistance Categories A through G, and Hazard Mitigation assistance in each of the Unified Hazard Mitigation Assistance Program's five grant programs. For example, the 2008-2011 State Mitigation Plan allowed the State and its communities to access nearly $57 million in mitigation grants to prepare plans and carry out projects. The 2014 New York State HMP was used as guidance in completing the Dutchess County HMP.

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

Within the NYSDEC – Division of Water, 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. The Bureau consists of the following Sections:

- Coastal Management: Works to reduce coastal erosion and storm damage to protect lives, natural resources, and properties through structural and non-structural means.
- Dam Safety: 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: Is responsible for reducing flood risk to life and property through construction, operation and maintenance of flood control facilities.
- Floodplain Management: 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.

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

Technical Bulletins for the 2010 Codes of New York State

The DCEA publishes 14 technical bulletins including two recent bulletins with guidance related to flood hazard areas: Electrical Systems and Equipment in Flood-damaged Structures and Accessory Structures. One archived bulletin from January 2003, Flood Venting in Foundations and Enclosures Below Design Flood Elevation, refers to the out-of-date edition of FEMA Technical Bulletin 1 and to American Society of Civil Engineers (ASCE) 24-98, which is not the edition referenced by the current codes.

Forms and Publications

The DCEA posts several model reporting forms and related publications on its web page. The Building Permit Application requests the applicant to indicate whether the site is or is not in a floodplain and advises checking with town clerks or NYSDEC. The General Residential Code Plan Review form includes a reminder to "add 2' freeboard." Sample Flood Hazard Area Review Forms, including plan review checklists and inspection checklists for Zone A and Zone V, are based on the forms in Reducing Flood Losses through the International Code Series published by International Code Council and FEMA (2008).

U.S. Army Corps of Engineers

The following are U.S. Army Corps of Engineers projects and studies that are currently or have been conducted in Dutchess County.

Ten Mile River Watershed

The New York District of the Corps of Engineers has completed a Federally-funded reconnaissance level study to determine whether there is a Federal interest in watershed-based flood risk management, ecosystem restoration, and other allied water resources problems and opportunities for the Ten Mile River Watershed, Dutchess County, New York and Litchfield County, Connecticut. In light of the recurrence of fluvial flood damage over the past several years, including that from inundation, erosion, and road washouts from the storms

of October 2005 and the severe storms of April 2007, which resulted in damages to the Towns of Amenia and Dover, New York, the Corps of Engineers examined the entire watershed (USACE 2015a).

The reconnaissance study has examined the current field conditions and study criteria to determine whether any watershed-based opportunities for flood risk management, ecosystem restoration or other allied purposes exist for continued Federal participation during detailed evaluation and construction. As part of this study, the water resources problems in the area were identified, along with potential solutions to such problems. Determination of Federal interest in the project is based on the preliminary screening of alternatives, as well as the extent of support by local officials and interested parties (USACE 2015a).

The District initiated the Reconnaissance Phase in September 2007. The reconnaissance report, released in September 2008, determined that there is a Federal interest in proceeding into a watershed-based feasibility study. The next step toward initiation of such a study would be the execution of a Project Partnership Agreement with a non-Federal sponsor, which has yet to be identified. The project is suspended until a local sponsor is identified (USACE 2015a).

For additional information and updates regarding this project, please refer to this website: http://www.nan.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/11241/Article/487525/fact-sheet-ten-mile-river-watershed.aspx

Dutchess County Watersheds

The New York District of the Corps of Engineers has finalized a federally-funded Reconnaissance Study to determine whether there is a federal interest in watershed-based flood risk management, ecosystem restoration, and other water resources problems and opportunities in the Dutchess County Watersheds. This study was initiated in light of the recurrence of fluvial flood risk management over the past several years, including that resulting from inundation, erosion, and road washouts associated with the storms of October 2005 and June 2006, as well as the severe storms of April 2007, which resulted in damages in the Fishkill Creek, Wappinger Creek, Fallkill Creek, and Roeliff Jansen Kill watersheds. The population density of Dutchess County continues to increase, exacerbating the problems of flooding, erosion, deposition, poor water quality, and ecosystem degradation, all of which threaten human welfare and the economy. From initial investigations, it appears that opportunities exist for flood risk management measures, balancing flow regimes, sediment transport control, water quality improvements, and riparian habitat restoration for the watersheds of Dutchess County (USACE 2015b).

The Reconnaissance Study was approved by Division on March 30, 2009. The Project Management Plan (PMP) for the Feasibility Study was submitted to the potential non-federal sponsor, Dutchess County Soil and Water Conservation District, in 2010. However, no funding agreement has been executed. The study is currently suspended (USACE 2015b).

For additional information and updates regarding this project, please refer to this website: http://www.nan.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/11241/Article/487543/fact-sheet-dutchess-county-watersheds.aspx

6.4.5 Fiscal Capabilities – County and Local

County Fiscal Capabilities

Partnership for Manageable Growth: Created in 1999, the Partnership for Manageable Growth helps protect important agricultural and open space resources. The program provides a locally funded match for land

preservation purchase price up to 50% of the total project cost. Since its inception, the program has helped protect over 3,350 acres of farmland and open space in Dutchess County.

Municipal Fiscal Capabilities

Dutchess County municipalities are able to fund mitigation projects though existing local budgets, local appropriations (including referendums and bonding), and through a myriad of federal and state loan and grant programs.

Additionally, Dutchess County created the Municipal Consolidation & Shared Services Grant Program in 2013 to incentivize municipal projects through a competitive process. These municipal projects should consolidate services, produce shared services, eliminate an entire government entity, evaluate municipal consolidation opportunities and implementation possibilities, establish the regional delivery of services, or offer other efficiency improvements. The result must be a smaller, smarter government service or project that yields savings for taxpayers.

6.4.6 Fiscal Capabilities – State and Federal

Federal Hazard Mitigation Funding Opportunities

Federal mitigation grant funding is available to all communities with a current hazard mitigation plan (this plan); however most of these grants require a "local share" in the range of 10-25% of the total grant amount. The FEMA mitigation grant programs are described below.

Hazard Mitigation Grant Program (HMGP)

The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each Federal disaster declaration. The HMGP can provide up to 75% funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved Hazard Mitigation Plan (this plan).

Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to NYS DHSES and placed in rank order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available.

Flood Mitigation Assistance (FMA) Program

The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is 75%. At least 25% of the total

eligible costs must be provided by a non-federal source. Of this 25%, no more than half can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. FMA funds are distributed from FEMA to the state. NYS DHSES serves as the grantee and program administrator for FMA.

Pre-Disaster Mitigation (PDM) Program

The PDM program is an annually funded, nationwide, competitive grant program. No disaster declaration is required. Federal funds will cover 75% of a project's cost up to $3 million. As with the HMGP and FMA, a FEMA-approved local Hazard Mitigation Plan is required to be approved for funding under the PDM program.

Federal and State Disaster and Recovery Assistance Programs

Following a disaster, various types of assistance may be made available by local, state and federal governments. The types and levels of disaster assistance depend on the severity of the damage and the declarations that result from the disaster event. Among the general types of assistance that may be provided should the President of the United States declare the event a major disaster are the following:

Individual Assistance (IA)

IA provides help for homeowners, renters, businesses and some non-profit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses may be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals may borrow up to $200,000 to repair or replace real estate, $40,000 to cover losses to personal property and an additional 20% for mitigation. For businesses, loans may be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible. Non-profit organizations such as charities, churches, private universities, etc. are also eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster. These loans are restricted, by law, to small businesses only.

Public Assistance (PA)

PA provides cost reimbursement aid to local governments (state, county, local, municipal authorities and school districts) and certain non-profit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services. This program is largely funded by FEMA with both local and state matching contributions required.

Small-Business Administration (SBA) Loans

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.

Homeowners may apply for up to $200,000 to replace or repair their primary residence. Renters and homeowners may borrow up to $40,000 to replace or repair personal property-such as clothing, furniture, cars, and appliances – damaged or destroyed in a disaster. Physical disaster loans of up to $2 million are available to qualified businesses or most private nonprofit organizations.

Social Services Block Grant

To address the needs of critical health and human service providers and the populations they serve, the State of New York will receive a total of $235.4 million in federal Superstorm Sandy Social Services Block Grant funding. The State will distribute $200,034,600 through a public and transparent solicitation for proposals. The State is also allocating $35.4 million in State Priority Projects, using the SSBG funding. Sandy SSBG resources are dedicated to covering necessary expenses resulting from Superstorm Sandy, including social, health and mental health services for individuals, and for repair, renovation and rebuilding of health care facilities, mental hygiene facilities, child care facilities and other social services facilities.

Department of Homeland Security

The Homeland Security Grant Program (HSGP) plays an important role in the implementation of the National Preparedness System by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation. The FY 2013 HSGP supports core capabilities across the five mission area of Prevention, Protection, Mitigation, Response, and Recovery based on allowable cost. HSGP is comprised of three interconnected grant programs including the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Operation Stonegarden (OPSG). Together, these grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration.

Community Development Block Grants (CDBG)

CDBG are federal funds intended to provide low and moderate-income households with viable communities, including decent housing, as suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration. Public improvements may include flood and drainage improvements. In limited instances, and during the times of "urgent need" (e.g. post disaster) as defined by the CDBG National Objectives, CDBG funding may be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event.

Community Development Block Grants – Disaster Recovery (CDBG-DR)

CDBG-DR funding supports the recovery process after Presidentially-declared disasters, particularly in low-income area, however this program is not currently available to support mitigation within Dutchess County.

U.S. Economic Development Administration

The U.S. Economic Development Administration (USEDA) is an agency of the U.S. Department of Commerce that supports regional economic development in communities around the country. It provides funding to support comprehensive planning and makes strategic investments that foster employment creation and attract private investment in economically distressed areas of the United States. Through its Public Works Program USEDA invests in key public infrastructure, such as in traditional public works projects, including water and sewer systems improvements, expansion of port and harbor facilities, brownfields, multitenant manufacturing and other facilities, business and industrial parks, business incubator facilities, redevelopment technology-based facilities, telecommunications and development facilities. Through its Economic Adjustment Program, USEDA administers its Revolving Loan Fund (RLF) Program, which supplies small businesses and entrepreneurs with the gap financing needed to start or expand their business, in areas that have experienced or are under threat of serious structural damage to the underlying economic base.

Homeownership Repair and Rebuilding Fund

The Homeownership Repair and Rebuilding Fund provides grants of up to an additional $10,000 to eligible homeowners who have already qualified for FEMA housing assistance's maximum grant ($31,900) and will not receive other assistance from private insurance or government agencies that would duplicate the grant's funding. The HRRF includes $100 million dedicated to help homeowners affected by Sandy and was provided directly from the State of New York.

Empire State Relief Fund

The Empire State Relief Fund is dedicated to providing resources to help recover from Hurricane Sandy and rebuild and restore homes. In many cases, New Yorkers face a substantial gap between the cost of repair or replacement of their home and the funds available to them to cover this cost. The Empire State Relief Fund will focus on long-term residential housing assistance to help fill the funding gap by providing up to $10,000 in additional grants. Homeowners eligible for the funding must have received the maximum FEMA grant assistance as well as the maximum funding from HRRF ($41,900). The ESRF is funded through donations where 100% of the money is dedicated to NYS housing programs.

Federal Highway Administration - Emergency Relief

The Federal Highway Administration Emergency Relief is a grant program that may be used for repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a result of a disaster. NYS is serving as the liaison between local municipalities and FHWA. $30 Million in funding was released in October-November of 2012 for emergency repair work conducted in first 180 days following Hurricane Sandy. Another $220 Million in additional funding became available February 2013.

Federal Transit Administration - Emergency Relief

The Federal Transit Authority Emergency Relief is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. Administered by the Federal Transit Authority at the U.S. Department of Transportation and directly allocated to MTA and Port Authority. This transportation-specific fund was created as an alternative to FEMA PA. Currently, a total of $5.2 Billion has been allocated to NYS-related entities.

Empire State Development

Empire State Development offers a wide range of financing, grants and incentives to promote business and employment growth, and real estate development throughout the State. Several programs address infrastructure construction associated with project development, acquisition and demolition associated with project development and brownfield remediation and redevelopment.

New York State Department of Transportation (NYSDOT)

Damaged Roads and Signals

High winds, storm tidal surge and flooding caused significant damage to NYSDOT facilities, roads and local transportation infrastructure in the Hudson Valley, Long Island and New York City. Repair and replacement will be necessary for these facilities and infrastructure. In some cases, municipalities will be direct applicants; therefore, not all FEMA-eligible costs are included for damaged infrastructure.

Scour around Culverts and Bridges

Scour has some of the most significant and destructive effects on roadway culverts and bridges. It is the result of fast flowing water's erosive action, which erodes and carries away foundation materials (sand and rocks from around and beneath abutments, piers, foundations and embankments). Water's intensity and velocity can quickly compromise the integrity of roadway culverts and bridges and is one of three main causes of bridge failures (the other two are collision and overloading). Superstorm Sandy, Tropical Storm Lee, and Hurricane Irene each exposed the vulnerability of the State's bridges and culverts to scour, as the storms weakened or damaged these structures across the State.

There are 20,000 bridges in New York State, with 91 state bridges, 731 local bridges and 431 culverts at risk of scour18. This program addresses scoured and critical roadway culverts and bridges. It provides replacements and/or permanent scour retrofits to facilities that are unable to protect the transportation system from storm events. Five hundred million dollars will be made available for this critical work.

U.S. Department of Agriculture Natural Resources Conservation Service Emergency Watershed Protection Program

The purpose of the Emergency Watershed Protection Program (EWP) was established by Congress to respond to emergencies created by natural disasters. The EWP Program is designed to help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) administers the EWP Program; EWP-Recovery, and EWP–Floodplain Easement (FPE).

EWP - Recovery

The EWP Program is a recovery effort program aimed at relieving imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences. Public and private landowners are eligible for assistance, but must be represented by a project sponsor that must be a legal subdivision of the State, such as a city, county, township or conservation district, and Native American Tribes or Tribal governments. NRCS may pay up to 75 percent of the construction cost of emergency measures. The remaining 25 percent must come from local sources and can be in the form of cash or in-kind services.

EWP work is not limited to any one set of measures. It is designed for installation of recovery measures to safeguard lives and property as a result of a natural disaster. NRCS completes a Damage Survey Report (DSR) which provides a case-by-case investigation of the work necessary to repair or protect a site.

Watershed impairments that the EWP Program addresses are debris-clogged stream channels, undermined and unstable streambanks, jeopardized water control structures and public infrastructures, wind-borne debris removal, and damaged upland sites stripped of protective vegetation by fire or drought.

EWP - FPE

Privately-owned lands or lands owned by local and state governments may be eligible for participation in EWP-FPE. To be eligible, lands must meet one of the following criteria:

- Lands that have been damaged by flooding at least once within the previous calendar year or have been subject to flood damage at least twice within the previous 10 years
- Other lands within the floodplain are eligible, provided the lands would contribute to the restoration of the flood storage and flow, provide for control of erosion, or that would improve the practical management of the floodplain easement
- Lands that would be inundated or adversely impacted as a result of a dam breach

EWP-FPE easements are restored to the extent practicable to the natural environment and may include both structural and nonstructural practices to restore the flood storage and flow, erosion control, and improve the practical management of the easement.

Structures, including buildings, within the floodplain easement must be demolished and removed, or relocated outside the 100-year floodplain or dam breach inundation area.

6.5 Mitigation Strategy Development and Update

6.5.1 Update of Municipal Mitigation Strategies

To evaluate progress on local mitigation actions, each jurisdiction with actions in previous DMA2000 or related plans was provided with a Mitigation Action Plan Review Worksheet. Each worksheet was pre-populated with those actions identified for their jurisdiction in the prior plan. For each action, municipalities were asked to indicate the status of each action ("No Progress/Unknown", "In Progress/Not Yet Complete", "Continuous", "Completed", "Discontinued") and provide review comments on each. Municipalities were requested to quantify the extent of progress, and provide reasons for the level of progress or why actions were discontinued. 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.

Local mitigation actions identified as "Complete", and those actions identified as "Discontinued", have been removed from the updated strategies. Those local actions that municipalities identified as "No Progress/Unknown", "In Progress/Not Yet Complete" as well as certain actions/initiatives identified as "Continuous", have been carried forward in their local updated mitigation strategies. Municipalities were asked to provide further details on these projects to help better define the projects, identify benefits and costs, and improve implementation.

Certain continuous or ongoing strategies represent programs that are, or since prior and existing local hazard mitigation plans have become, fully integrated into the normal operational and administrative framework of the community. Such programs and initiatives have been identified within the Capabilities section of each annex, and removed from the updated mitigation strategy.

At the Kick-Off and subsequent planning meetings, all participating municipalities were provided surveyed to further assist in identifying mitigation activities completed, ongoing and potential/proposed. As new additional potential mitigation actions, projects or initiatives became evident during the plan update process, including as part of the risk assessment update and as identified through the public and stakeholder outreach process (see Section 3), communities were made aware of these either through direct communication (local meetings, email, phone) or via their draft municipal annexes.

The County and municipalities identified projects that have been submitted to NYS DHSES for grant funding, including projects for which Letters of Intent (LOI) and grant applications have been submitted under the Irene/Lee and Sandy Hazard Mitigation Grant Programs. In general, LOI/application-based projects submitted directly by the communities are identified within their updated mitigation strategies. Communities may also have included other LOI/application-based projects submitted by special-purpose districts (e.g. fire or school districts), local utilities, and hospitals and health care entities.

To help support the selection of an appropriate, risk-based mitigation strategy, each annex provided a summary of hazard vulnerabilities identified during the plan update process, either directly by municipal representatives, through review of available county and local plans and reports, and through the hazard profiling and vulnerability assessment process.

Beginning in March 2015, members of the Steering Committee and contract consultants worked directly with each jurisdiction (phone, email, local support meetings) to assist with the development and update of their annex and include mitigation strategies, focusing on identifying well-defined, implementable projects with a careful consideration of benefits (risk reduction, losses avoided), costs, and possible funding sources (including mitigation grant programs).

Concerted efforts were made to assure that municipalities develop updated mitigation strategies that included activities and initiatives covering the range of mitigation action types described in recent FEMA planning guidance (FEMA "Local Mitigation Planning Handbook" March 2013), specifically:

- Local Plans and Regulations – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- 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 the National Flood Insurance Program and Community Rating System, StormReady (NOAA) and Firewise (NFPA) Communities.

In consideration of federal and state mitigation guidance, the Steering Committee recognized that all municipalities would benefit from the inclusion of certain mitigation initiatives. These include initiatives to address vulnerable public and private properties, including RL and SRL properties; initiatives to support continued and enhanced participation in the NFIP; improved public education and awareness programs; and initiatives to support countywide and regional efforts to build greater local mitigation capabilities.

In May 2015, a mitigation strategy workshop was conducted by FEMA Region II representatives for all participating jurisdictions to support the identification, evaluation and prioritization of local mitigation strategies, as well as how to present and document this process within the plan. Based on FEMA's guidance and recommendations provided at this workshop and otherwise, the following significant modifications to the mitigation strategy identification and update process and documentation was made:

- An overarching effort has been made to better focus local mitigation strategies to clearly defined, readily actionable projects and initiatives that meet the definition or characteristics of mitigation. Broadly defined mitigation objectives have been eliminated from the updated strategy unless accompanied by discrete actions, projects or initiatives.
- Certain continuous or ongoing strategies that represent programs that are, or since prior and existing plans have become, fully integrated into the normal operational and administrative framework of the community have been identified within the Capabilities section of each annex, and removed from the updated mitigation strategy.
- Where applicable, mitigation projects have been documented with an Action Worksheet, based on FEMA's Action Worksheet templates and recent guidance documents.

As part of the plan update process, the County sponsored an NFIP, NFIP Reform and CRS informational workshop for all plan participants in July, 2015 which was well attended. Subsequent to the workshop, several communities participated in a municipal floodplain administration program evaluation exercise designed to help communities understand their floodplain management program's strengths and weaknesses, and identify areas of improvement which may be included in their updated mitigation strategies.

FEMA Action Worksheets have been included for new physical projects identified by the County and participating municipalities. Physical projects being carried forward from the prior plan strategies are not necessarily documented on Action Worksheets as the project screening, identification and development, and

prioritization process was accomplished during the last planning process. Whether or not the projects were new or "carry forward", and documented on Action Worksheets or not, all projects included in the updated County and local mitigation strategies have identified hazards addressed, project description, benefits, costs, responsible party, sources of funding, timeline and priority. Further, non-physical actions (e.g. integration actions, studies, etc.) are typically not documented on Action Worksheets.

As discussed within the hazard profiles in Section 5.4, the long term effects of climate change are anticipated to exacerbate the impacts of weather-related hazards including extreme temperatures, flood, severe storm, severe winter storm and wildfire. By way of addressing these climate change-sensitive hazards within their local mitigation strategies and integration actions, communities are working to evaluate and recognize these long term implications and potential impacts, and to incorporate in planning and capital improvement updates.

Municipalities included mitigation actions to address vulnerable critical facilities. These actions have been proposed in consideration of protection against 500-year events, or worst-case scenarios. When determined to be feasible and practical, mitigation planning for critical facilities identified as previously sustaining flooding and/or being located in a FEMA floodplain will be developed to achieve protection to the 500-year flood event or the actual worst-damage scenario, whichever is greater.

It is recognized, however, that in the case of projects being funded through Federal mitigation programs, the level of protection may be influenced by cost-effectiveness as determined through a formal benefit-cost analysis. In the case of "self-funded" projects, municipal discretion must be recognized. Further, it must be recognized that the County and municipalities have limited authority over privately-owned critical facility owners with regard to mitigation at any level of protection.

6.5.2 Update of County Mitigation Strategy

The update of the county-level mitigation strategies included a review of progress on the actions/initiatives identified in the 2006 Dutchess County HMP, using a process similar to that used to review municipal mitigation strategy progress. The County, through their various department representatives, were provided with a Mitigation Action Plan Review Worksheet identifying all of the county-level actions/initiatives from the 2006 plan. For each action, relevant county representatives were asked to indicate the status of each action ("No Progress/Unknown", "In Progress/Not Yet Complete", "Continuous", "Completed", "Discontinued"), and provide review comments on each.

Projects/initiatives identified as "Complete", as well as though actions identified as "Discontinued", have been removed from this plan update. Those actions the county has identified as "No Progress/Unknown", "In Progress/Not Yet Complete" or "Continuous" have been carried forward in the County's updated mitigation strategy.

Throughout the course of the plan update process, additional regional and county-level mitigation actions have been identified. These were identified through:

- Review of the results and findings of the updated risk assessment;
- Review of available regional and county plans, reports and studies;
- Direct input from County departments and other county and regional agencies
- Input received through the public and stakeholder outreach process.

As discussed within the hazard profiles in Section 5.4, the long term effects of climate change are anticipated to exacerbate the impacts of weather-related hazards including extreme temperatures, flood, severe storm, severe winter storm and wildfire. As such, the County has included mitigation actions and initiatives, including

continuing and long term planning and emergency management support, to address these long term implications and potential impacts.

Various County departments and agencies have included mitigation actions to address vulnerable critical facilities. These actions have been proposed in consideration of protection against 500-year events, or worst-case scenarios. It is recognized, however, that in the case of projects being funded through Federal mitigation programs, the level of protection may be influenced by cost-effectiveness as determined through a formal benefit-cost analysis. In the case of "self-funded" projects, local government authority must be recognized. Further, it must be recognized that the County has limited authority over privately-owned critical facility owners with regard to mitigation at any level of protection.

6.5.3 Mitigation Strategy Evaluation and Prioritization

Section 201.c.3.iii of 44 CFR requires an action plan describing how the actions identified will be prioritized.

Recent FEMA planning guidance (March 2013) identifies a modified STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) mitigation action evaluation methodology that uses a set of 10 evaluation criteria suited to the purposes of hazard mitigation strategy evaluation. This method provides a systematic approach that considers the opportunities and constraints of implementing a particular mitigation action. The October mitigation workshop presented by FEMA representatives further amplified these evaluation criteria, and indicated that communities may want to consider other factors.

Based on this guidance, the Steering Committee and planning partnership have developed and applied an action evaluation and prioritization methodology which includes an expanded set of fourteen (14) criteria to include the consideration of cost-effectiveness, availability of funding, anticipated timeline, and if the action addresses multiple hazards.

The fourteen (14) evaluation/prioritization criteria used in the 2015 planning process are:

1. Life Safety – How effective will the action be at protecting lives and preventing injuries?
2. Property Protection – How significant will the action be at eliminating or reducing damage to structures and infrastructure?
3. Cost-Effectiveness – Are the costs to implement the project or initiative commensurate with the benefits achieved?
4. Technical – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
5. Political – Is there overall public support for the mitigation action? Is there the political will to support it?
6. Legal – Does the municipality have the authority to implement the action?
7. Fiscal - Can the project be funded under existing program budgets (i.e., is this initiative currently budgeted for)? Or would it require a new budget authorization or funding from another source such as grants?
8. Environmental – What are the potential environmental impacts of the action? Will it comply with environmental regulations?
9. Social – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
10. Administrative – Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
11. Multi-hazard – Does the action reduce the risk to multiple hazards?
12. Timeline - Can the action be completed in less than 5 years (within our planning horizon)?

13. Local Champion – Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?
14. Other Local Objectives – Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?

Participating jurisdictions were asked to use these criteria to assist them in evaluating and prioritizing mitigation actions identified in the 2014 update. Specifically, for each mitigation action, the jurisdictions were asked to assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria, defined as follows:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Further, jurisdictions were asked to provide a brief summary of the rationale behind the numeric rankings assigned, as applicable. The numerical results of this exercise were then used by each jurisdiction to help prioritize the action or strategy as "Low", "Medium," or "High." While this provided a consistent, systematic methodology to support the evaluation and prioritization of mitigation actions, jurisdictions may have additional considerations that could influence their overall prioritization of mitigation actions.

It is noted that jurisdictions may be carrying forward mitigation actions and initiatives from prior mitigation strategies that were prioritized using different, but not necessarily contrary, approaches. Mitigation actions in existing and prior Dutchess County municipal HMPs were prioritized according to the following criteria:

- **High Priority:** A project that meets multiple plan goals and objectives, benefits exceed cost, has funding secured under existing programs or authorizations, or is grant-eligible, and can be completed in 1 to 5 years (short-term project) once project is funded.
- **Medium Priority:** A project that meets at least one plan goal and objective, benefits exceed costs, funding has not been secured and would require a special funding authorization under existing programs, grant eligibility is questionable, and can be completed in 1 to 5 years once project is funded.
- **Low Priority:** A project that will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, and project is not grant-eligible and/or timeline for completion is considered long-term (5 to 10 years).

It is important to note that certain initiatives from the 2006 Dutchess County HMP and other local single- and multi-jurisdictional HMPs within the County are being carried forward in their updated strategies, with or without modification. These initiatives were previously prioritized using approaches that may be different from that used in this update process; however it is reasonable to assume that all evaluation and prioritization approaches included similar considerations (e.g. mitigation effectiveness, technical and administrative feasibility, cost-effectiveness, etc.).

At their discretion, jurisdictions carrying forward prior initiatives were encouraged to re-evaluate their priority, particularly if conditions that would affect the prioritization criteria had changed. Where communities have determined that their original priority ranking for "carry forward" initiatives remained valid, their earlier priority ranking is indicated on the prioritization table, however the 2015 criteria ratings are indicated with a null "-" marking.

For the 2015 plan there has been an effort to develop more clearly defined and action-oriented mitigation strategies. These local strategies include projects and initiatives that have been well-vetted, and are seen by the community as the most effective approaches to advance their local mitigation goals and objectives within their

capabilities. As such, many of the initiatives in the updated mitigation strategy were ranked as "High" or "Medium" priority, as reflective of the community's clear intent to implement, available resources not-withstanding. In general, initiatives that would have had "low" priority rankings were appropriately screened out during the local action evaluation process.

6.5.4 Benefit/Cost Review

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review applied in for the evaluation and prioritization of projects and initiatives in this plan update process was qualitative; that is, it does not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. For all actions identified in the local strategies, jurisdictions have identified both the costs and benefits associated with project, action or initiative.

Costs are the total cost for the action or project, and may include administrative costs, construction costs (including engineering, design and permitting), and maintenance costs.

Benefits are the savings from losses avoided attributed to the implementation of the project, and may include life-safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When available, jurisdictions were asked to identify the actual or estimated dollar value for project costs and associated benefits. Having defined costs and benefits allows a direct comparison of benefits versus costs, and a quantitative evaluation of project cost-effectiveness. Often, however, numerical costs and/or benefits have not been identified, or may be impossible to quantitatively assess.

For the purposes of this planning process, jurisdictions were tasked with evaluating project cost-effectiveness with both costs and benefits assigned to "High", "Medium" and "Low" ratings. Where quantitative estimates of costs and benefits were available, ratings/ranges were defined as:

Low = < $10,000 Medium = $10,000 to $100,000 High = > $100,000

Where quantitative estimates of costs and/or benefits were not available, qualitative ratings using the following definitions were used:

Table 6-2. Qualitative Cost and Benefit Ratings

Costs	
High	Existing funding levels are not adequate to cover the costs of the proposed project, and implementation would require an increase in revenue through an alternative source (e.g., bonds, grants, and fee increases).
Medium	The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
Low	The project could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.
Benefits	
High	Project will have an immediate impact on the reduction of risk exposure to life and property.
Medium	Project will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.
Low	Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-effective.

For some of the projects and initiatives identified, jurisdictions may seek financial assistance under FEMA's HMGP or Hazard Mitigation Assistance (HMA) programs. These programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed when funding applications are prepared, using the FEMA BCA model process. The planning partnership is committed to implementing mitigation strategies with benefits that exceed costs. For projects not seeking financial assistance from grant programs that require this sort of analysis, the planning partnership reserves the right to define "benefits" according to parameters that meet its needs and the goals and objectives of this plan.