

## Chapter 4: Mitigation Strategies

This section presents mitigation actions for Madison County to reduce potential exposure and losses identified as concerns in the Risk Assessment portion of this plan. The planning committee reviewed the Risk Assessment to identify and develop the mitigation actions presented herein.

This section includes:

- 1) Background and Past Mitigation Accomplishments
- 2) General Mitigation Plan Approach
- 3) Review and Update of Mitigation Goals and Objectives
- 4) Summary of Plans, Programs and Resources Available to Support Mitigation
- 5) Review and Update of Mitigation Strategies

**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.

### Background and Past Mitigation Accomplishments

In accordance with DMA 2000 requirements, 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, 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 2008 Madison County All Hazards Mitigation Plan. Current efforts represent the requisite five-year plan update and include participation from all municipal governments and key county and regional stakeholders.
- All municipalities participating in this Plan participate in the National Flood Insurance Program (NFIP), which requires the adoption of FEMA floodplain mapping and certain minimum construction standards for building within the floodplain. Municipalities have actively participated in available mitigation grant funding opportunities to implement mitigation projects, including the ongoing New York Rising Community Reconstruction Program (NYRCR).
- The County and municipalities have implemented mitigation actions to protect critical facilities and infrastructure throughout the planning area. For example, the Highway Department maintains a multi-year, rotating program of roadway and culvert (drainage) maintenance and improvements to help mitigate storm water damage to county roads.
- The NY Rising study was the result of combined efforts on the part of State, County and local agencies/entities to examine natural hazards affecting Madison County. Results from this study were reviewed and incorporated into this plan.
- Municipalities in Madison County have adopted land use and zoning regulatory standards 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.
- The County has been incorporating flood risk reduction through storm water management into its infrastructure and building improvement projects. All projects, especially in areas adjacent to waterways, are oversized to accommodate the potential of future flooding. \$75,000.00 is budgeted annually by Madison County for the Madison County Soil and Water Conservation District (MCSWCD) to assist local municipalities in mitigating water-related hazards.

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## General Mitigation Planning Approach

FEMA and NYS regulations and guidance are the foundation on which the County and municipalities developed local mitigation strategies. Plans reviewed include:

- DMA 2000 regulations, specifically 44 CFR 201.6 (Local Mitigation Plans)
- FEMA Local Mitigation Planning Handbook, March 2013
- FEMA Local Mitigation Plan Review Guide
- 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: A Resource for Reducing Risk to Natural Hazards, January 2013

The mitigation strategy update includes the following steps, all further detailed later in the plan:

- 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.

## 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.

## Mission Statement

Per FEMA guidance (386-1), the development of a mission statement or guiding principle provides a purpose for those participating in the planning process and brings focus to their planning activities. It's not the goal because it does not describe outcomes, but it is broad in scope, and provides a direction for those undertaking the planning process. The Madison County Hazard Mitigation Steering Committee developed a mission statement during the original county hazard mitigation planning process. The 2016 committee reviewed the mission statement and elected to maintain it without edit or amendment. The statement reads:

*"The communities of Madison County are dedicated to enhancing our rural charm, natural beauty, and strong community values, while preserving our family farms, growing our friendly neighborhoods and supporting our locally owned businesses by embracing smart growth strategies.*

*Our focus is on reducing future risk from natural disasters. We will build strong, smarter and safer, to ensure the long term resiliency of our people, property and natural resources."*

## 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 original goals and objectives were established by the Planning Committee during the 2008 planning process and were based on the risk assessment results, discussions, research, and input from committee members, existing authorities, policies, programs, resources, stakeholders and the public. The Planning Committee identified six goals through a facilitated exercise, working from a catalog of goal statements created through review of similar plans and FEMA planning guidance. Once the goals were established,

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objectives that meet multiple goals were selected through a similarly facilitated exercise. 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 Madison County goals are compatible with the needs and goals expressed in other available community planning documents as well as the NYS HMP. Achievement of these goals helps to define the effectiveness of a mitigation strategy.

**Objectives** are short-term aims which, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Objectives were then developed and/or selected by the Planning Committee based on its knowledge of the local area, review of past efforts, findings of the risk assessment, qualitative evaluations, and identification of mitigation options. The objectives will be used to 1) measure the success of the plan once implemented, and 2) to help prioritize identified mitigation actions. The Planning Committee selected objectives that would

meet multiple goals. The objectives serve as a measurement of a mitigation action, rather than as a subset of a goal. Achievement of the objectives will be a measure of the effectiveness of a mitigation strategy. The objectives also are used to help establish priorities.

During the 2013 plan update process, the Steering Committee reviewed the 2008 goals and objectives. Further, all participating municipalities were provided a Goals and Objectives worksheet to facilitate their input to the update process. The 2008 goals and objectives were reviewed in consideration of the hazard events and losses since the 2008 plan, the updated hazard profiles and vulnerability assessment, the goals and objectives established in the other related State, county and local risk management plans, as well as direct input on how the County and municipalities recognize they need to move forward to best manage their hazard risk.

As a result of this review process, the Goals and Objectives for the 2015 update remain unchanged, as indicated in Tables 11 and 12.

**Table 11 Madison County Hazard Mitigation Plan Goals**

Goal Number	Goal Statement
G-1	Protect Life
G-2	Protect Property
G-3	Protect Economic Viability
G-4	Protect the Environment
G-5	Promote Hazard Mitigation Awareness and Education
G-6	Develop and Implement Mitigation Strategies that use Public Funds in a Cost-Effective way.

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**Table 12 Madison County Hazard Mitigation Plan Objectives**

Objective Number	Objective Statement
O-1	Encourage hazard mitigation measures that result in the least adverse effect on the natural environment and that use natural processes.
O-2	Strengthen codes so that new construction can withstand the impacts of natural hazards and lessen the impact of that development on the environment's ability to absorb the impact of natural hazards. (Focused on new construction and codes that can affect land use – addresses both protecting the environment and assuring construction is hazard resistant, something also addressed in the next objective)
O-3	Prevent (or discourage) new development in hazardous areas or ensure that if building occurs in high-risk areas that it is done in such a way as to minimize risk
O-4	Integrate the recommendations of this plan into existing County and local plans/programs (incl. comprehensive and emergency operations plans).
O-5	Incorporate hazard considerations into land-use planning and natural resource management.
O-6	Seek partnership opportunities with stakeholders in hazard mitigation that will leverage resources and enhance opportunities to implement mitigation activities within the planning area.
O-7	Seek mitigation actions that will assist in protecting lives and property by making homes, businesses, infrastructure and critical facilities more resistant to hazards.
O-8	Better characterize flood/storm water hazard events by conducting additional hazard studies and identify inadequate storm water facilities and poorly drained areas.
O-9	Develop or improve early warning emergency response systems and evacuation procedures (this is directly life safety)
O-10	Develop and implement additional education and outreach programs to increase public awareness of the risks associated with hazards and to educate the public on specific, individual mitigation, preparedness, and response and recovery activities.
O-11	Ensure continuity of government operations, emergency services, and essential facilities at the local level during and immediately after disaster and hazard events.
O-12	Strengthen inter-jurisdiction and inter-agency communication, coordination, and partnerships in all phases of emergency management.
O-13	Retrofit, purchase, or relocate structures in high hazard areas including those known to be repetitively damaged

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**Table 13: Madison County Hazard Mitigation Plan Goals & Objectives**

Objective #	Mitigation Objectives  Objective Statement	Mitigation Goals					
		Protect Life	Protect Property	Protect Economic Viability	Protect the Environment	Promote HM Education and Awareness	Dev/Imp. Strat. Using Public Funds Efficiently
0-1	Encourage hazard mitigation measures that result in the least adverse effect on the natural environment and that use natural processes. (Geared towards restoration – aimed more at existing construction)		X		X		X
0-2	Strengthen codes so that new construction can withstand the impacts of natural hazards and lessen the impact of that development on the environment’s ability to absorb the impact of natural hazards. (Focused on new construction and codes that can affect land use – addresses both protecting the environment and assuring construction is hazard resistant, something also addressed in the next objective)	X	X		X		
0-3	Prevent (or discourage) new development in hazardous areas or ensure that if building occurs in high-risk areas that it is done in such a way as to minimize risk	X	X	X			X
0-4	Integrate the recommendations of this plan into existing County and local plans/programs (incl. comprehensive and emergency operations plans).	X		X	X		X
0-5	Incorporate hazard considerations into land-use planning and natural resource management.	X		X	X		X
0-6	Seek partnership opportunities with stakeholders in hazard mitigation that will leverage resources and enhance opportunities to implement mitigation activities within the planning area.			X			X
0-7	Seek mitigation actions that will assist in protecting lives and property by making homes, businesses, infrastructure, and critical facilities more resistant to hazards.	X	X	X			
0-8	Better characterize flood/storm water hazard events by conducting additional hazard studies and identify inadequate storm water facilities and poorly drained areas.				X	X	
0-9	Develop or improve early warning emergency response systems and evacuation procedures (this is directly life safety)	X				X	
0-10	Develop and implement additional education and outreach programs to increase public awareness of the risks associated with hazards and to educate the public on specific, individual mitigation, preparedness, and response and recovery activities.	X	X			X	X
0-11	Ensure continuity of government operations, emergency services, and essential facilities at the local level during and immediately after disaster and hazard events.	X		X			
0-12	Strengthen inter-jurisdiction and inter-agency communication, coordination, and partnerships in all phases of emergency management.	X		X			X
0-13	Retrofit, purchase, or relocate structures in high hazard areas including those known to be repetitively damaged		X				

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## Summary of Plans, Programs and Resources Available to Support Mitigation

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 Madison County are presented below.

### *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). 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 and regulations that reduce future flood damages. Please refer to Section 5.4.3 for information on recent legislation reforming 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 community implementation of floodplain management requirements, and by the purchase of flood insurance by property owners. 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 Madison County actively participate in the NFIP. As of April 31, 2015, there were 606 NFIP policyholders in Madison County. There have been 346 claims made, totaling nearly \$5.2 million for damages to structures and contents. There are 16 NFIP Repetitive Loss (RL) properties, and 0 NFIP Severe Repetitive Loss (SRL) properties in the County. Further details on the County's flood vulnerability may be found in the flood hazard profile in Chapter 3.

Municipal participation in and compliance with the NFIP is supported at the Federal level by FEMA Region II and the Insurance Services Organization (ISO), and at the state-level by the New York State Department of Environmental Conservation (NYSDEC) and New York State Office of Emergency Management (NYS DHSES). The State and communities may adopt higher regulatory standards when implementing the provisions of the NFIP. Guidelines currently in place include the following:

- **Freeboard:** NYS law requires Base Flood Elevation plus two feet (BFE+2) for all single- and two-family residential construction, and BFE+1 for all other types of construction. Communities may exceed this requirement by mandating additional freeboard or BFE+2 for all types of construction. A number of communities have embraced these more rigorous requirements by recommending site plan review and zoning board approvals. For example, some communities allow the height of a structure to incorporate BFE+2 rather than measure from grade within the floodplain.
- **Cumulative Substantial Improvements/Damages:** The NFIP allows improvements valued at up to 50% of the building's present value without meeting the flood protection requirements. Over time, a community may issue a succession of permits for different repairs or improvement to the same structures, which can greatly increase the risk of the structural and community flood damage. The community may choose to establish cumulative substantial improvement guidelines 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.

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### *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. 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).

### *New York State Flood Plain Management*

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

In 1992, the New York State Legislature amended an existing law because “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,” new state law required 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.”

This law NFIP also require 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 now designated as the office 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 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.

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## Land Use Planning

Madison County is located between the cities of Syracuse and Utica and generally experiences a rather slow pattern of development. Suburban spillover development from the Syracuse area reaches slightly into western Madison County in the towns of Sullivan and Cazenovia. As a general rule, Madison County sees a rather slow creep of roadside development in its rural areas and small villages. Nothing on the current horizon indicates that this pattern will change to any great degree.

County and municipal land use planning can be leveraged to mitigate flooding and support natural hazard risk reduction. Each community's current land use planning mechanisms are identified below.

**Table 14: Land Use Plans and Regulations in Effect in Madison County**

	Building & Fire		Floodplain	Junkyard/Junk Storage	Mobile House	Refuse	Sanitary	Tele-communications	Site Plan Review	Subdivision	Zoning	Local Right to Farm	Comprehensive Plan	Road Use Law/Agreement	County Floodplain Administrator
	county	local													
<b>Towns</b>															
Brookfield		X	X	X	X	X	X			X		X	X	X	
Cazenovia		X	X	X	X	X	X	X	X	X	X	X	X		
DeRuyter		X	X	X	X	X	X	X	X	X	X	X			
Eaton		X								X	X		X		
Fenner		X	X	X	X	X	X			X	X				
Georgetown		X													
Hamilton		X								X	X				
Lebanon		X		X	X	X	X	X	X	X	X				
Lenox		X	X	X	X	X	X	X	X	X	X	X	X	X	
Lincoln		X	X	X	X	X	X	X	X	X	X				
Madison		X							X	X			X		
Nelson		X					X	X	X	X	X				
Smithfield		X													
Stockbridge		X													
Sullivan		X	X	X	X	X	X	X	X	X	X	X	X	X	
<b>Cities</b>															
Oneida		X	X	X	X	X	X	X	X	X	X		X		
<b>Villages</b>															
Canastota		X	X	X	X	X	X	X	X	X	X		X		
Cazenovia		X	X	X	X	X	X	X	X	X	X		X	X	
Chittenango		X	X	X	X	X	X	X	X	X	X		X		
DeRuyter		X													
Earlville		X													
Hamilton		X	X	X	X	X	X	X	X	X	X				
Madison		X													
Morrisville		X	X	X	X	X	X	X	X	X	X				
Munnsville		X													
Wampsville		X	X	X	X	X	X	X	X	X	X	X	X	X	

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## *Mitigating Environmental Impact in Natural Gas Development in New York State*

The Article 23, Title 3 of the Environmental Conservation Law (ECL) delegates all authority to regulate natural gas drilling to the NYS DEC. The ECL specifies that local governments retain jurisdiction over local roads and their rights under the Real Property Tax Law. NYS DEC's Division of Mineral Resources administers regulations and a permitting program to mitigate to the greatest extent possible any potential environmental impact of drilling and well operation. NYSDEC inspects well sites and reviews all plans for natural gas well sites addressing flood zones, spacing unit decisions, etc.

Natural gas is primarily transported by pipelines. Interstate pipelines are regulated by the Federal Energy Regulatory Commission (FERC) and intrastate pipelines are regulated by the New York State Public Service Commission (NYSPSC). The intrastate pipelines are under the jurisdiction of the NYSPSC Gas Safety Division. Low-pressure (<125 psi) gathering pipelines are regulated by the Gas Safety Division. Towns do not have regulatory authority over them. The PSC has regulatory authority over intrastate lines at all levels, including, but not limited to, the Safety Division.

The Madison County Planning Department maintains a Natural Gas webpage (<https://www.madisoncounty.ny.gov/planning/natural-gas>) that includes links to the activities of the Madison County Natural Gas Working Group, and the Four County Natural Gas Collaborative (Madison, Otsego, Delaware and Chenango Counties), as well as mitigation strategies Madison municipalities can implement to address some of the impacts (primarily heavy vehicle traffic over local roads, and noise) of natural gas development.

The Four County Natural Gas Collaborative met actively in 2011, but has not formally convened since that time. The Madison County Natural Gas Working Group met from 2008 through 2012, but has not formally convened since 2012. The 239 Review process includes stipulations that major new projects would be brought before the County review committee at the County level before construction begins. Should there be a natural gas spill or explosion, the community's response is outlined in the County Emergency Plan developed by the Madison County Emergency Management Department.

## ***Administrative and Technical Capabilities - Local***

### *Madison County Planning Department*

The mission of the Planning Department is to improve the quality of life in Madison County by providing professional services and programs that promote economic vitality, environmental integrity and strong communities. The Madison County Planning Department serves a diverse array of functions and assists with efforts such as: County Parks administration, Climate and Sustainability initiatives, snowmobile trails, First Time Homebuyers programs, Geographic Information Systems (GIS) mapping, water quality management, agricultural districts, local land use planning and assistance, and more.

### *Madison County Soil & Water Conservation District*

The Madison County Soil & Water Conservation District is committed to the conservation of the natural resources of our region. The Soil and Water Conservation District works primarily with the farming community to assist producers in implementing management practices that promote soil health and increase the water quality of our region. The Soil & Water District acts as both an administrator of government funds and as a technical service provider for management practices relating to grazing, livestock waste management, riparian buffers, comprehensive nutrient management plans, manure management, field & crop management, wetland construction, and livestock watering systems.

As a County agency, the District provides free technical advice on other water, soil and agricultural issues. The District has often been called to help mitigate storm water issues, drainage issues (both agricultural and nonagricultural) and other land management problems and inquiries.

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## *Madison County Public Health – Environmental Division*

The vision and mission of the Madison County Public Health-Environmental Division is to provide essential environmental services with honesty, integrity and respect by knowledgeable staff dedicated to excellence and focused on the needs of our community. The Division enhances the quality of life in Madison County by implementing effective and efficient environmental and public health programs. These programs serve local municipalities and the public by applying the Public Health Laws and the Sanitary Codes to identify and reduce the environmental risks of living and working in Madison County. The six main program areas include: air quality, disease prevention, engineering services, food, lodging and temporary residences, summer recreation, and water and septic systems.

## *Local Code Enforcement Officials*

Local towns and villages are responsible for the administration and enforcement of New York State Uniform Fire Prevention and Building Codes in Madison County. The code was designed to insure the safety of new and existing homes, shops, restaurants, places of worship, workplaces and more. This is accomplished through oversight of planning, construction, and use of all buildings.

Code enforcement staff work closely with Public Health-Environmental staff, Child-Protective Services, the Department of Social Services, the Department of Environmental Conservation, Town and Village Officials, local Fire Departments, and the Office of Emergency Management to provide a safe and clean environment for all residents of Madison County.

## *Madison County Office of Emergency Management (OEM)*

The mission of the Madison County Office of Emergency Management (OEM) and all of its staff is to enhance and improve the overall Fire and EMS operations and safety in Madison County by providing staff services such as staff training, fire investigation, supervision of Emergency Medical Services, fire protection programs, technical support (such as Threat Credibility Assessment, Dive, Rope Rescue and Search & Rescue teams), public relations, and by providing guidance to and support for all Fire and EMS agencies of Madison County.

OEM staff operates the EOC during planned and emergency incidents and fills various functions during the activation, response, recovery and mitigation phase of disasters by coordinating planning efforts, response, resource acquisition, and the department is also responsible for and tracking the progress of mitigation planning activities for Madison County and its jurisdictions.

To support public notification during emergency situations, OEM utilizes a number of different gateways and social media. The website [www.madisoncounty.ny.gov/EM](http://www.madisoncounty.ny.gov/EM) provides information on how to prepare for emergencies and become more resilient. NY-Alert is utilized to reach people quickly during an emergency situation, and Facebook and Twitter enhance information sharing through social media. The following list describes how OEM uses public notifications:

- Distribute alerts of road closures, emergency evacuations (both locations of where evacuations are being ordered, as well as specified evacuation routes, shelter information and more).
- Disseminate National Weather Service forecasts for the local region.
- Manage river and stream gauge information for all local rivers running through Madison County, including the Oneida, Chittenango and Cowaselon Creeks.
- Inform about power outages by using links to National Grid, NYSEG and Madison COOP.
- Share road work updates from the NY-511 system.
- Post emergency preparedness information.

The Madison County OEM works with the Binghamton NWS to monitor how regional and national weather will impact the county, especially during peak seasons for flooding and severe storms.

## *Madison County Highway Department*

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The Madison County Department of Public Works (DPW) is responsible for 425 centerline miles of roadways and 125 bridges within Madison County. The department is charged with designing, constructing, and maintaining an extensive infrastructure system and providing oversight on capital projects large and small. DPW stands ready to assist whenever possible on work carried out by city, town and village public works departments.

### ***Administrative and Technical Capabilities – State and Regional***

The following entities support mitigation activities as described.

#### *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 (NYSOEM) and its predecessor agencies coordinate activities of all State agencies to protect New York communities and promote the State's economic well-being by coordinating response to natural and man-made disasters and other emergencies. NYS DHSES routinely assists local governments, voluntary organizations, and private industry through emergency management programs that include, among other efforts, community training for hazard identification, loss prevention, planning, training, operational response to emergencies, technical support, and disaster recovery programs.

NYS DHSES administers FEMA mitigation grant programs, maintains the NYS Hazard Mitigation plan, and supports statewide and local mitigation with grant funding and by providing technical support. The current State HMP was developed cooperatively with input from other State agencies, authorities and organizations. It was approved by FEMA in 2015 [is this correct date? The plan expires in December 2018 per Joe S.] and maintains the state's eligibility for recovery assistance in Public Assistance Categories A through G, and for assistance from each of FEMA's five Unified Hazard Mitigation Assistance programs. In the years 2008-2011, the State's HMP positioned New York State and its jurisdictions to garner nearly \$57 million in mitigation grant funding – money that allowed communities to prepare mitigation plans and carry out mitigation projects. The document was used as a resource in completing the Madison County HMP Update.

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

The Division of Water, 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)*

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- **Technical Bulletins for the 2016 Codes of New York State**  
The DCEA publishes 14 technical bulletins. Two recent bulletins included updated guidance on managing flood-prone areas: Electrical Systems, and Equipment in Flood-damaged Structures and Accessory Structures. The January 2003 bulletin titled 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, resources not referenced in a more edition of relevant 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).

## ***Fiscal Capabilities-Federal and State***

The ability of a community to implement mitigation projects and initiatives is almost entirely dependent on available funding. Madison County is able to fund some mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and through a myriad of Federal and State loan and grant programs.

## ***Federal Hazard Mitigation Funding Opportunities***

Federal mitigation grant funding is available to all communities that have in place a current hazard mitigation plan (such as this one). Such funding also a “local share” funding match 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 made available to states by FEMA after each federal disaster declaration. It provides up to 75% funding for cost-effective hazard mitigation projects that protect and reduce potential damage to public or private property in future disasters. Examples of such projects include acquisition and demolition of structures in hazard prone areas; flood-proofing or elevation; structural improvements; and the development of state and local standards. Projects must be consistent with the community’s mitigation strategy. All applicants must have a FEMA-approved hazard mitigation plan like the one being developed through this local mitigation planning process.  
  
Eligible applicants for HMGP funding included state and local governments, certain nonprofit organizations, institutions that perform essential government services. Indian tribes, and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP but must request funding through their local government. Applications are submitted to NYS DHSES and then prioritized through a ranking process. The State then submits all applications to FEMA for approval. Eligible projects not selected for funding are placed on inactive status and may be reconsidered should additional HMGP funding become available.
- ***Flood Mitigation Assistance (FMA) Program***  
The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. FMA allows states and communities to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The program is funded annually and, as such, does not require a federal disaster declaration for funding. Only NFIP-insured homes and businesses are eligible for the limited mitigation money available

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through this program. As happens with HMGP, the case of individual property owners is managed through their application to a local jurisdiction for submission by the State to FEMA. The FMA federal cost share is 75%, so 25% of the cost 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. The community submitting the project for consideration must have in place FEMA-approved local flood mitigation plan. Because FMA funds are distributed from FEMA to the state, NYS DHSES serves as the grantee and program administrator.

- *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, and local applicants must submit their application to the State for consideration by FEMA

### ***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. By law these loans are restricted to small businesses.

- *Public Assistance (PA)*

PA provides cost reimbursement aid to local governments (state, county, local, municipal authorities and school districts) and certain non-profit agencies affected by disaster. Also eligible are facilities or property that deliver government-like services and suffered loss or were damaged. This program is funded by FEMA but 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 real estate, personal property, machinery and equipment, and inventory and business assets that were damaged or destroyed in a declared disaster. 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. Persons who do not qualify for IA funding are referred to the SBA program.

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- *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 received a total of \$235.4 million in federal Superstorm Sandy Social Services Block Grant funding. The State distributed \$200,034,600 through a public and transparent solicitation for proposals and allocated \$35.4 million in State Priority Projects using the SSBG funding. Sandy SSBG resources have been dedicated to covering necessary expenses resulting from Superstorm Sandy. These include social, health and mental health services for individuals, and repair, renovation and rebuilding of health care, mental health, child care 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 helping communities build and sustain capabilities essential to achieving the National Preparedness Goal of having a secure and resilient nation. Based on allowable cost, the HSGP supports core capabilities across five mission areas: Prevention, Protection, Mitigation, Response, and Recovery. HSGP is comprised of three interconnected grant programs. These include the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and Operation Stonegarden (OPSG). Together these grant programs fund a range of preparedness activities, including planning, organization, equipment purchases, training, exercises, and management and administration.
- *Community Development Block Grants (CDBG)*

CDBG are federal funds that provide low and moderate-income households with resources to develop and maintain viable communities, including decent housing, a suitable living environment, and expanded economic opportunities. Eligible projects for CDBG funding include community facilities, roads and infrastructure, housing rehabilitation and preservation, development activities, public service delivery, 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)*

On September 27, 2013, the New York State Homes & Community Renewal Office of Community Renewal finalized the Madison County Floodplain Managing document in accordance with Executive Order 11988. The State of New York was awarded funding to be administered by the New York State Homes and Community Renewal (HCR) to provide financial assistance to homeowners whose residences were substantially damaged by storms Sandy, Lee and Irene. Funding was distributed to a number of New York Counties, including Madison County. HCR awarded funding in accordance with the State of New York Action Plan For Community Development Block Grant Program – Disaster Recovery (Action Plan). The Action Plan provides for, among other things, home buyout and acquisition assistance to owners of 1-2 family homes. This Floodplain Management Document applies to homes in Madison County, New York (Action Plan Activities). “Buyouts” involve the acquisition and demolition of properties located within a floodplain. Structures and improvements will be removed and the land returned to its natural state in perpetuity.

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- *NYCDEP Flood Hazard Mitigation Implementation (FHMI) Program*

The Flood Hazard Mitigation Implementation (FHMI) Program funds property protection measures, floodplain reclamation, public infrastructure protection and property buyout/relocation. These projects must be identified through a Local Flood Analysis (LFA) conducted in watershed municipalities. Studies are conducted by consultants and funded by the New York City Department of Environmental Protection's Stream Management Program, or by those engaged through other flood response programs.

Municipalities with completed LFAs may apply to the Catskill Watershed Corporation for funds to implement projects recommended in the analysis. Communities secure LFA funding by contacting their Stream Management Program partner (generally the county Soil & Water Conservation District). Details are available at <http://www.cwconline.org/index.html>.

- *Governor's Homeownership Repair and Rebuilding Fund (HRRF)*

HRRF is a \$100 million State fund dedicated to helping homeowners affected by Superstorm Sandy. It provides grants of up to an additional \$10,000 to eligible homeowners who qualified for FEMA Individual Assistance maximum grant (\$31,900). Homeowners are not eligible to receive additional or private funding that would duplicate HRRF funding.

- *Empire State Relief Fund (ESRF)*

The Empire State Relief Fund provides funding to those affected by Hurricane Sandy who are experiencing a gap between what it will cost to repair or replace their home and the amount of available funds. The ESRF focuses on long-term residential housing assistance and will provide a grant of up to \$10,000 per house. The money is available to homeowners who received the maximum FEMA IA grant and maximum funding from HRRF (\$41,900). ESRF is funded through donations, with 100% of the money dedicated to supporting NYS post-Sandy housing recovery.

- *Federal Highway Administration - Emergency Relief*

Federal Highway Administration Emergency Relief may be used for repair or reconstruction of Federal-aid highways and roads on Federal lands that suffered disaster-related damage. NYS serves as the liaison between local municipalities and FHWA. During first 180 days following Hurricane Sandy (October-November of 2012), \$30 million was released in for emergency repair work. An additional \$220 million became available in February 2013.

- *Federal Transit Administration - Emergency Relief*

The Federal Transit Authority Emergency Relief 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.

### ***United States Department of Agriculture (USDA)***

- *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 was created to help communities 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's Natural Resources Conservation Service (NRCS) administers the EWP Program; EWP-Recovery, and EWP-Floodplain Easement (FPE).

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- *EWP - Recovery*

EWP Recovery alleviates imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences. Public and private landowners are eligible for assistance, but they must be represented by a legal government sponsor from the state, a municipality, conservation district, a Native American Tribe or Tribal governments. NRCS contributes to 75 percent of the construction cost of emergency measures. The remaining 25 percent can be provided as cash or in-kind support from local sources.

EWP it is designed to support installation of recovery measures to safeguard lives and property as a result of a natural disaster. The first step in to securing funding is for NRCS to complete a Damage Survey Report (DSR) that provides a detailed description of the work necessary to repair or protect a site.

EWP addresses watershed impairments including: debris-clogged stream channels; streambanks that are undermined and unstable; water control structures and public infrastructures and are in jeopardy of failing; removal of wind-borne debris; and restoration of damaged upland sites stripped of protective vegetation by fire or drought.

- *EWP - Floodplain Easement*

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

- The land was damaged by flooding at least once within the previous calendar year, or was subject to flood damage at least twice within the previous 10 years
- The land would contribute to the restoration of the flood storage and flow, provide for control of erosion, or improve the practical management of the floodplain easement
- Land that has been or could be inundated or adversely impacted as a result of a dam breach

To the extent practicable, easements are restored to the natural environment. The work may incorporate structural and nonstructural practices to restore the flood storage and flow, erosion control, and improve easement management. Structures, including buildings, within the floodplain easement must be demolished and removed, or relocated outside the 100-year floodplain or dam breach inundation area.

## Mitigation Strategy Development and Update

### Update of Municipal Mitigation Strategies

To evaluate progress on local mitigation actions, each jurisdiction that included actions in the 2008 plan was provided with a Mitigation Action Plan Review Worksheet. Worksheets were pre-populated with actions included in the previous plan. Municipalities were asked to provide comments on each and to indicate the status of each as one of the following: No Progress/Unknown, In Progress/Not Yet Complete, Continuous, Completed, or Discontinued. Municipalities were also asked to quantify the extent of progress (e.g.: 50% complete) and describe successes or lack thereof. Each jurisdictional annex of this plan includes a table identifying the community's previously stated mitigation strategies, the status of the actions and initiatives, and the how the action fits into the updated strategy.

Local mitigation actions identified as Complete and Discontinued were removed from 2016 plan. Actions identified as No Progress/Unknown, In Progress/Not Yet Complete, and Continuous were carried forward to the current mitigation strategy. Municipalities were asked to provide more detailed information about the project description, benefits to the community, cost, and the implementation process.

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Some continuous or ongoing strategies are now fully integrated into the normal community operational and administrative framework. Because they are now identified in the capabilities section of each annex, they were removed from the updated mitigation strategy. The jurisdictional annex also encapsulates the findings of each community's risk assessment, including mitigation strategies developed. Municipal representatives reviewed local data to develop a strategy appropriate for their community.

In, October 2013, the Madison County contracted with the Soil and Water Conservation District (SWCD) to work with each jurisdiction (by phone or email, or at local support meetings) and update of their annex. The consultant helped each community create well-defined, feasible projects (strategies) that incorporated a benefit-cost analysis (BCA). The BCA was done to help communities weigh the benefits of risk reduction and future losses avoided against project cost and the availability of potential funding. Communities were encouraged to develop a range of initiatives similar to those described in recent FEMA planning guidance (Local Mitigation Planning Handbook, March 2013). Such efforts would include projects that address:

- Local Plans and Regulations. This includes government authorities, policies or codes that influence the way land is developed and structures built.
- Structure and Infrastructure Projects. Such projects modify existing structures and infrastructure improve resiliency or remove the structure from a hazard area.
- Natural Systems Protection. Projects to minimize damage or preserve or restore the functions of natural systems.
- Education and Awareness Programs. Programs that inform and educate citizens, elected officials, and property owners about hazards and how to mitigate against same. Efforts may also include participation in I programs such as the National Flood Insurance Program (NFIP), the Community Rating System (CRS) and StormReady (NOAA).

The Planning Committee recognized that all municipalities would benefit from the inclusion of projects to mitigate RL and SRL properties; support continued and enhanced participation in the NFIP; improved public education and awareness programs; and enhance countywide and regional mitigation capabilities.

## Update of County Mitigation Strategies

County-level mitigation strategies were reviewed using a process similar to that used by municipalities: documenting the progress of previously identified action items using action worksheet and updating the status of each. Action items are similarly included or eliminated from the updated plan based on their status.

Throughout the update process, participants identified regional and county-level mitigation actions by:

- Reviewing the findings of the updated risk assessment;
- Reviewing available regional and county plans, reports and studies;
- Securing input from County departments regional agencies, including:
  - Madison County Planning Department
  - Madison County Emergency Management
  - Madison County Highway Department
  - Madison County Public Health Department
  - Madison County Soil and Water Conservation District
- Documenting Input received through the public and stakeholder outreach process.

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The update also incorporates findings about the long-term effects of climate change that may exacerbate the impact of weather-related hazards. These include extreme temperatures, flood, severe storm, severe winter storm and wildfire. As such, the County has included mitigation actions to address these long term implications and potential impacts. County departments and agencies have developed mitigation actions to identify vulnerable critical facilities. Such actions were created to protect such structures against a 500-year event or other worst-case scenario, particularly if a facility was identified as being located in a flood zone. As aforementioned, the level of protection for a given federally-funded project is subject to a formal BCA. Locally-funded projects are subject to local government authority, although the County has limited authority over privately-owned critical facilities.

## **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 ten evaluation criteria to develop a mitigation strategy. This method provides a systematic approach that considers the opportunities and constraints of implementing a particular mitigation action. The January 2015 mitigation workshop presented by FEMA representatives further amplified these evaluation criteria, and indicated that communities may want to consider other evaluation factors. Considering all of these inputs, the Steering and Planning Committee developed a prioritization methodology that includes an expanded set of fourteen (14) criteria listed below.

- 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?

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- 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 evaluate and prioritize actions identified in the 2013 update. They were directed to assign a numeric rank (-1, 0, or 1) to each criteria as follows:

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

Jurisdictions were asked to provide a brief summary of the rationale behind the numeric rankings. Numeric results were then used by each jurisdiction to prioritize the strategy as Low, Medium, or High. While this provided a systematic evaluation methodology for use countywide, jurisdictions were free to incorporate additional considerations in developing local priorities.

It’s worth noting that jurisdictions may carry forward previous actions and initiatives prioritized using a different system that is in keeping with the current approach. Mitigation actions from the 2008 plan were prioritized using the following criteria:

- **High Priority:** A project that meets multiple 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).

Certain initiatives from the 2008 HMP were carried forward with or without modification. Jurisdictions doing so 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.

In 2016, there was an effort to develop clearly defined, action-oriented mitigation strategies. This approach led to identification of well-vetted projects and initiatives seen by the community as the most effective approach to advancing mitigation goals and objectives within the scope of their capabilities. As such, many of the initiatives in the updated mitigation strategy were ranked as High or Medium priority, indicating the

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community’s intent to implement the action with available resources. In general, initiatives assigned low priority rankings were eliminated during the local action evaluation process.

## Benefit/Cost Review

Section 201.6.c.3iii of 44CFR requires the plan to emphasize the extent to which benefits are maximized based on a benefit/cost review. In other words, the cost-effectiveness criteria must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review used qualitative evaluation methods. It did not include the level of detail required by FEMA for project eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant. For all actions identified in the local strategies, jurisdictions have identified costs and benefits associated with a project, action or initiative.

**Costs presented include** the total project estimation. This may include administrative, construction (engineering, design and permitting), and maintenance costs.

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

When possible, jurisdictions were asked to identify the actual or estimated dollar costs and associated benefits. Often numerical costs and/or benefits were not identified and may be impossible to quantify. But jurisdictions were asked to evaluate project cost-effectiveness using High, Medium and Low ratings. Where estimates of cost and benefit were available the ratings were defined as:

Low = < \$10,000  
\$100,000

Medium = \$10,000 to \$100,000

High = >

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

**Table 15: Qualitative Cost and Benefit Ratings**

<b>Costs</b>	
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.
<b>Benefits</b>	
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.

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## **Mitigation Strategy Prioritization**

One or more strategies may be developed to address a need. Successful communities blend traditional stabilization and repair actions with a holistic, forward-looking view of recovery and resiliency. This section identifies strategies that best use community assets, capitalize on opportunities, and resolve critical issues. Thinking about how the 2013 rains affected the community, the planning committee asked whether a given project would protect a community should such an event be repeated.

Participants also identified whether projects would protect vulnerable populations

For every need or opportunity, potential strategies were generated for each Recovery Support Function (RSF) with the goal of identifying strategies with benefits in multiple RSFs. Potential strategies span an array of methodologies and timeframes, from preparedness to retrofits, from immediate procedural improvements to long-range capital investments programs. Strategies may also include conservation of natural protective features, regulatory changes and building code updates, structural defenses, resilient retrofits, market measures, land use planning, and education and outreach in an effort to employ multiple, complementary actions rather than relying on a single means of protection.

Careful consideration was given to what is at risk, what resources are available, and the capacity to implement various management measures. As resiliency strategies evolved into specific projects and actions, consideration was given to how each strategy relates to impacts from the summer 2013 rain events on the Community; to what extent each strategy would reduce current and projected risk; whether it contributed to protection of vulnerable populations; feasibility of a successful implementation; compliance with existing regulations; upfront and long-term maintenance costs; direct and indirect benefits; and public perception and support.

Reconstruction and resiliency strategies were developed which were derived from assets at risk relative to the Community's needs, as identified in the previous sections of this Plan. Each strategy was designed to take into account the following considerations:

1. Whether it reduced the level of risk and met an identified Community need;
2. Whether it helped (or improved the resiliency of) vulnerable populations; and
3. Whether it could be implemented through discrete programs and/or projects.

Tables on the following pages show the developed strategies.

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**Table 15: Mitigation Strategies**

STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Floodproof existing electrical and natural gas infrastructure located in the floodplain and create a backup system of power.	Madison County#1	Emergency Power Generation for Municipal Buildings and Shelters	Flooding caused widespread power outages including emergency shelters and municipal buildings throughout the County. This project will identify and prepare buildings in various locations Countywide to receive power via the purchase of mobile generators which can be shared or relocated as needed during power outages. On-site electrical will likely be necessary for building preparation.	Madison County (in partnership with the Towns of Brookfield, DeRuyter and Madison)	\$650,000	Medium
Secure equipment necessary for emergency responders to function during a storm event.	Madison County#2	Fire Department PFDs and Dry Suits	The project will provide vital rescue services to the public. Local fire departments within the County are in need of 64 dry suits and 150 Personal Floation Devices (PFDs) for first responders for use in flood events as well as a cache of sandbags for flood abeyance.	Madison County, Office of Emergency Management	\$68,950	Medium
Upgrade and/or relocate critical government facilities out of the floodplain.	Madison County#3	Resiliency Evaluation of Municipal Facilities Countywide	This project would evaluate the resiliency of municipal and governmental facilities located in or adjacent to the floodplain.	Madison County Planning Department and Madison County Soil & Water	\$400,000	Medium
Ensure diversity of safe, affordable housing options in areas not prone to flooding.	Madison County#4	Countywide Housing Needs Evaluation	This evaluation would determine existing and future housing needs within the County's hamlets and villages.	Madison County Planning Department	\$100,000	Medium
Provide incentives for elevation or retrofit of homes.	Madison County#5	Residential Floodproofing Assistance Program	This project will provide assistance to floodproof homes within the 100-year floodplain which are unable to relocate.	Madison County	\$500,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	Madison County#6	Poolville Road Culvert Repairs	The flooding resulted in damages to the culvert at Poolville Road (County Route 89), between Smith Road and Hamilton Road. The project will replace the existing 4' concrete pipe with a 16'-2" by 5'1" aluminum box culvert, 49.5' in length	Madison County Highway Department	\$84,000	Medium
	Madison County#7	Fearon Road Culvert Repairs	The flooding resulted in damages to the culvert at Fearon Road (County Route 47), between Pratts Road and Rocks Road. The project will replace the existing 4' concrete pipe with a 14'-8" by 4'-1" aluminum box culvert, 49.5' in length.	Madison County Highway Department	\$66,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	Madison County#8	Cole Street Drainage Project	Drainage structures lack the capacity to handle severe storm rainfall amounts. This is a combination of inadequately sized and/or design to handle severe storm events. Upgrade culvert from 36" to 48"x60' and upgrade 21" culvert to 30"x60'.	Madison County	\$25,000	Medium
	Madison County#9	Fenner Street, Town of Fenner, Drainage Project	Drainage structures lack the capacity to handle severe storm rainfall amounts. This is a combination of inadequately sized and/or design to handle severe storm events. Upgrade culvert 5' diameter culvert to 5'x8'x60' box culvert.	Madison County	\$35,000	Medium
	Madison County#10	Dugway Road Culvert Repairs	Drainage structures lack the capacity to handle severe storm rainfall amounts. This is a combination of inadequately sized and/or design to handle severe storm events.	Madison County	\$14,900	Medium
Enhance public safety and wellbeing within communities downstream from high-hazard dams.	Madison County#11	Individual Dam Hazard Awareness Program	Develop a public education campaign regarding the hazards associated with living downstream from a high hazard dam, especially those properties located within inundation areas.	Madison County	\$10,000	Medium
Enhance public safety and awareness of the danger of living in rural areas.	Madison County#12	Community Wildfire Protection Plans	Under a program sponsored by the U.S. Forest Service, a Community Wildfire Protection Plan can be written for any municipality in Madison County. The plan would address issues as wildfire response, hazard mitigation including hazardous fuels reduction, and community preparedness between agency personnel and community leaders.	Madison County	\$25,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	Madison County#13	Creek Road Grade Stabilization	Install a grade stabilization structure to collect gravel washouts following severe storm events.	Madison County	\$5,000	Medium
Enhance public safety and wellbeing within flood impacted neighborhoods.	Madison County#14	Upham Road (Town of Georgetown) Drainage Project	Drainage structures lack the capacity to handle severe storm rainfall amounts. This is a combination of inadequately sized and/or design to handle severe storm events. Excavating 10000' of streambed and construct a grade control structure.	Madison County	\$150,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	Madison County#15	Stream Channel Excavation behind Christina Drive	Reduce restrictions preventing storm water from flowing in the area of Christina Drive in the Village of Wampsville.	Madison County Highway Dept. & Village of Wampsville	\$8,600	Medium
Retrofit, purchase, or relocate structures in high hazard areas including those known to be repetitively damaged.	C/Oneida#1	Special Flood Hazard Area Buy-out	The City will work with NYS DHSES and FEMA in developing a buy-out program to permanently remove structures from the special hazard area.  Fewer homes in floodplains throughout Oneida would result in less government expenditures related to emergency response services and evacuations for flooded residential areas in the City.	City of Oneida Engineer's Office	\$21,000,000	High
Upgrade and/or relocate critical government facilities out of the floodplain.	C/Oneida#2	City of Oneida DPW Garage Relocation	Flooding of the Oneida Creek resulted in 3-4 feet of water in the City of Oneida DPW garage and substantial damages, including structural, to the existing City DPW garage building as well as the loss of equipment. Along with equipment and vehicle damage, an oil (motor, transmission, hydraulic) spill occurred in the garage due to the flood. The existing facility is 4.6 feet below the 100-year floodplain and directly south of the worst observed streambank overtopping. The project will relocate the City DPW garage and related facilities out of the 100-year floodplain boundary. A new facility with sustainable features would be designed, bid and then constructed on City-owned property.	City of Oneida Public Works	\$1,900,000	High
	C/Oneida#3	Relocation of the Oneida City Water Department Garage	Flooding of the Oneida Creek resulted in 3-4 feet of water in the City of Oneida Water Department garage (adjacent to the Oneida DPW) located at Sconodoa Street and substantial damages and equipment loss. The existing facility is a one-story slab on grade structure, approximately 3,000 SF in size and sits over 4 feet below the flood elevation. The project will relocate the Water Department to a new facility out of the 100-year floodplain.	City of Oneida Public Works	\$480,000	High

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Upgrade and/or relocate critical government facilities out of the floodplain.	C/Oneida#4	Relocation of the Oneida City Salt Shed	Flooding of the Oneida Creek via bank and bridge overtopping resulted in damages to the City of Oneida's salt shed whose slab is located 1-foot above flood elevation. A loss of materials occurred as well. The existing facility has a 1,000 ton material capacity. The project will relocate the salt shed to a new facility out of the 100-year floodplain.	City of Oneida Public Works	\$60,000	High
Enhance public safety and wellbeing within flood impacted neighborhoods.	C/Oneida#5	Flood Impacted Housing Demolition	The flood impacted homes are structurally unstable and unfit to live in. By demolishing these homes the risk of further contamination, mold growth, or structural failure will be eliminated benefiting the adjacent property owners and community.	City of Oneida Engineer's Office	\$324,000	High
Upgrade or enhance facilities to ensure public health, safety and environmental protection.	C/Oneida#6	Sealed Sanitary Manholes	The summer of 2013 flooding resulted in an influx to the City of Oneida's Wastewater Treatment Plant (WWTP) processes, overwhelming the processes. Contaminated floodwater entering the plant created issues with biological processes for treating wastewater.	City of Oneida Public Works	\$41,400	Medium
Provide floodproof emergency shelter and facilities for the community.	C/Oneida#7	Oneida Armory Flood Barrier Installation	Flooding of the Oneida Creek via bank and bridge overtopping resulted in three feet of water, which entered via the garage and entry doors, on the ground floor of the Parks & Recreation Armory in the City of Oneida. During the floods, the armory's upper level floors were being used as a flood shelter until water began entering the ground level. Flood victims were required to relocate to another shelter. The project will install a FEMA approved stackable or passive flood barrier for the 16-ft. wide garage door and entry access.	City of Oneida Public Works	\$50,000	Medium
Stabilize streambanks that are severely eroded of at high risk of collapse.	C/Oneida#8	Maxwell Field Streambank Stabilization and restoration	This project will repair, reestablish and stabilize approximately 485 linear feet of streambank through replacement of rip-rap and geotextile.	City of Oneida Public Works	\$48,000	Medium
	C/Oneida#9	Sunset Lake Dam Rehabilitation	Conduct an inspection to determine the needs of this location, develop a plan for immediate improvements and preventative maintenance.	City of Oneida Engineer's Office	\$25,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	C/Oneida#10	Higinbotham Brook Channel Improvements	Upgrading structure under roads and bridges would reduce flooding of residential and commercial properties from a 100 year storm.	City of Oneida Public Works	\$1,500,000	Medium
Ensure a diversity of safe, affordable housing options in areas not prone to flooding.	C/Oneida#11	Housing Needs Evaluation	This evaluation would also work with the City to identify options for housing relocation to areas outside the floodplain. The effort would coordinate with various local and state entities as well as non-profit organizations and higher education institutions.	City of Oneida Planning Dept.	\$50,000	Medium
	C/Oneida#12	Affordable Downtown Rental Housing	This project would allow for an affordable housing option residents in need of relocation while keeping them in the same neighborhood, school, church, etc.	City of Oneida Planning Dept.	\$11,000,00 (est. Oneida City share \$500,000)	Medium
Provide incentives for elevation or retrofit of homes.	C/Oneida#13	Residential Floodproofing Assistance Program	This project will provide assistance to floodproof homes within the 100-year floodplain which are unable to relocate.	City of Oneida Planning Dept.	\$500,000	Medium
Stabilize streambanks that are severely eroded or at high risk of collapse.	T/Brookfield#1	Town of Brookfield Streambank Stabilization and Restoration	The project will reestablish approximately 1,000 linear feet of eroded and washed out streambank and install channel lining rock and check dams. The Town highway department will perform the construction.	Town of Brookfield Highway Dept.	\$120,000	Medium
	T/Brookfield#2	Town of Brookfield Streambank Stabilization	Road flooding occurred on Skaneateles Turnpike at Taylor's Tack & Feed Store, involving multiple properties. The flooding is the result of stream erosion and blockage of culverts. Install stream channel grade stabilization to prevent or reduce future erosion during severe storms.	Town of Brookfield Highway Dept.	\$40,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair,	T/Cazenovia#1	Maple Road Reconstruction	Maple Road was damaged from flooding that occurred during the summer 2013 storms. This project will involve the reconstruction of approximately 1,000 feet of Maple Road, from State Route 13 west to Lincklean Road.	Town of Cazenovia Highway Dept.	\$60,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
improvements and protection.	T/Cazenovia#2	Ridge Road Flood Reconstruction	The flooding resulted in damages to Ridge Road and the surrounding drainage area. The project will include flood and stormwater mitigation via the installation of storm sewer piping and culverts, and ditch stabilization near the entrance of Cazenovia Lake at Ridge Road and Ten Eyck Avenue.	Town of Cazenovia Highway Dept.	\$108,937	Medium
	T/DeRuyter#1	Carey Road Culvert Repairs	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events.	Town of DeRuyter Highway Dept.	\$144,000	Medium
Stabilize streambanks that are severely eroded of at high risk of collapse.	T/DeRuyter#2	Carey Road Streambank Stabilization	Flooding of an unnamed tributary to the Middle Branch Tioughnioga Creek resulted in damages to Carey Road and adjacent homes in the Town of DeRuyter.	Town of DeRuyter Highway Dept.	\$109,680	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	T/DeRuyter#3	South Hill Road Stabilization and Restoration	Flooding eroded roadside ditches resulting in damages to South Hill Road. The project will include the installation of four catch basins with grates, replacement of 400 feet of culvert pipe and repaving of 0.15 miles along South Hill Road creating an underground closed drainage system.	Town of DeRuyter Highway Dept.	\$37,272	Medium
	T/Eaton#1	Williams Corners Road Culvert Repairs	Flooding of the Electric Light Stream resulted in damages to Williams Corner Road including three culverts being washed out, taking the road with it. Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection. The road was closed for five weeks and made access to properties difficult. The project will include replacement with single arch culvert to handle flows.	Town of Eaton Highway Dept.	\$240,000	Medium
	T/Eaton#2	Roberts Road Culvert Repairs	The flooding resulted in damages to the culvert at Roberts Road. The project will repair and upgrade the first culvert below Williams Corner Road to handle calculated flow levels.	Town of Eaton Highway Dept.	\$240,000	Medium
	T/Eaton#3	Route 20 Remediation	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events. Flooding of an unnamed tributary to the Chenango River in the Town of Eaton resulted in damages to 8 homes and businesses as well as RT20.	Town of Eaton Highway Dept.	\$42,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and	T/Fenner#1	Rouses Road Culvert Repairs	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events. The undersized culvert at this location needs to be upgraded. SWCD staff will assist Town Highway with runoff calculations and culvert sizing.	Town of Fenner Highway Dept.	\$35,000	Medium
	T/Fenner#2	Roberts Road Culvert Repairs	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events. A debris guard consisting of a slanting grate over the culvert entrance could be constructed at this location.	Town of Fenner Highway Dept.	\$5,000	Medium
	T/Georgetown #1	Jones Road Culvert Repairs	Flooding of an unnamed tributary to the Middle Branch Tioughnioga Creek resulted in damages to Jones Road impeding access for residents. The project will include a culvert repair and improvement along the road.	Town of Georgetown Highway Dept.	\$12,000	Medium
	T/Georgetown #2	Bonney Road Culvert Repairs	Flooding of the Stone Mill Brook resulted in damages to the culvert on Bonney Road. The project will include the repair of this culvert.	Town of Georgetown Highway Dept.	\$18,000	Medium
	T/Hamilton#1	Williams Road Culvert Repairs	The flooding resulted in damages to the culvert at Williams Road and S. Hamilton Road. The project will replace the existing 10' by 30' culvert with a 14' box culvert and guide rail.	Town of Hamilton Highway Dept.	\$360,000	Medium
	T/Hamilton#2	Harris Road Culvert Repairs	Flooding of an unnamed tributary to Beaver Creek resulted in damages to the culvert at Harris Road and Moscow Road. The project will replace the existing culvert with a 6' by 30' culvert.	Town of Hamilton Highway Dept.	\$90,000	Medium
	T/Hamilton#3	Borden Road Culvert Repairs	Flooding of an unnamed tributary to the Sangerfield River resulted in damages to the culvert at Borden Road. The project will replace the existing, undersized 30" culvert with a new 4' culvert, 25' in length.	Town of Hamilton Highway Dept.	\$12,000	Medium
	T/Lebanon#1	Carncross Road Culvert Repairs	Flooding of the South Lebanon Brook resulted in damages to the bridge at Carncross Road/South Lebanon Road and adjacent residences. The project will replace the headwall pipe and poured square boxed culvert pipe with wings of 16 feet.	Town of Lebanon Highway Dept.	\$111,953	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
	T/Lebanon#2	Thompson Hill Road Repairs	The flooding damaged Thompson Hill Road. This project will include approximately 1,500 linear feet of road ditch reshaping and shoulder reestablishment to the bottom of ditch with medium riprap to stabilize the slope. Medium riprap will also be used to ensure better road stability.	Town of Lebanon Highway Dept.	\$78,960	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	T/Madison#1	Abbott Road Culvert Repairs	Flooding of an unnamed tributary to the Sangerfield River resulted in the wash out of a single 4' by 5' culvert at Abbott Road causing severe damage to the road and adjacent residences and agricultural lands. The project will include replacement of the damaged culvert with a single 5' by 7' squash culvert to handle calculated flows.	Town of Madison Highway Dept.	\$36,000	Medium
	T/Madison#2	Johnny Cake Hill Road Bridge Replacement	Improve drainage under the road at this location. The bridge at this location requires replacement.	Town of Madison Highway Dept.	\$25,000	Medium
	T/Madison#3	South Street Culvert	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events.	Town of Madison Highway Dept.	\$36,000	Medium
	T/Nelson#1	Jones Road Culvert Repairs	Runoff from forest land resulted in flooding damages to the culvert at Jones Road at the junction of Old State Road. The project will replace the existing 15" by 50' culvert with a 30" by 50' culvert and replace the existing 24" by 50' culvert with a 36" by 50' culvert.	Town of Nelson Highway Dept.	\$19,200	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	T/Nelson#2	Hughes Road Culvert Repairs	Runoff from higher elevations resulted in flooding damages to the culvert at Hughes Road. The project will replace the existing 15" by 50' culvert with a 24" by 50' culvert.	Town of Nelson Highway Dept.	\$6,000	Medium
	T/Nelson#3	Thomas Road Culvert Road	Runoff from higher elevations resulted in flooding damages to the culvert at Thomas Road. The project will replace the existing 18" by 40' culvert with a 30" by 50' culvert.	Town of Nelson Highway Dept.	\$9,600	Medium
	T/Nelson#4	Green Road Reconstruction	Flooding resulted in damages to North Lake Road. The project will install 650' of 18" culvert with 6 drop basins, pave or riprap bank shoulders, install two concrete headwalls, replace the existing 15" by 100' culvert with a 24" by 100' culvert, and install debris catchers.	Town of Nelson Highway Dept.	\$12,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	T/Nelson#5	North Lake Road Culvert Repairs	Build increased drainage capacity of the under-road structure reducing flooding and road erosion during severe storm events.	Town of Nelson Highway Dept.	\$60,000	Medium
	T/Nelson#6	Sunrise Boulevard Reconstruction	Runoff from higher elevations resulted in flooding damages to Sunrise Boulevard. The project will enlarge and line 200' of ditch and replace a 24" by 30' culvert with a 30" by 30' culvert.	Town of Nelson Highway Dept.	\$12,000	Medium
	T/Nelson#7	Eden Hollow Road Improvement	Stabilize road-side embankment to reduce erosion that deposits soil onto roadway during severe storm events.	Town of Nelson Highway Dept.	\$15,000	Medium
	T/Nelson#8	Hall Road Drainage System	Prevent road shoulder washing out during severe storm events and icing conditions during the winter months.	Town of Nelson Highway Dept.	\$9,100	Medium
	T/Smithfield#1	Armoring of Problem Road Ditches	Protect ditches on North Butler, Northrup, East Mile Strip and South Butler Road from erosion.	Town of Smithfield Highway Dept.	\$31,600	Medium
	T/Smithfield#2	Old County Road Culvert Improvement	Under-sized culvert under Old County Road in the Town of Smithfield results in flooding due to limited flow-thru. Replace under-sized culvert with appropriate sized culvert. Madison County Soil & Water will assist Town Highway with flow calculations and sizing.	Town of Smithfield Highway Dept.	\$15,000	Medium
	T/Stockbridge #1	Bishop Road Culvert Repairs	The flooding resulted in damages to Bishop Road. The project will replace the existing undersized 30" round culvert with a 42" round culvert.	Town of Stockbridge Highway Dept.	\$3,662	Medium
	T/Stockbridge #2	Quarry Road Culvert Repairs	Flooding from an unnamed tributary to Blue and Oneida Creeks resulted in damage to the culvert at Quarry Road. The project will replace the existing undersized 24" by 36" rectangular culvert with a 48" round culvert.	Town of Stockbridge Highway Dept.	\$4,051	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	T/Stockbridge #3	Haslauer and Cook Road Culvert Repairs	The flooding resulted in damages to three culverts on Haslauer and Cook Roads. The project will replace the existing undersized culverts with larger culverts to handle the calculated flows	Town of Stockbridge Highway Dept.	\$300,000	Medium
	T/Sullivan#1	Chittenango Creek Log-jam Clearings	The project will remove debris and logjams from approximately 10 miles of the creek extending from south of Chittenango to Oneida Lake.	Town of Sullivan Highway Dept.	\$36,000	Medium
Reduce vulnerability of existing infrastructure assets						

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
	T/Sullivan#2	Raise Elevation of Houses to Above Floodplain Elevation	This project would raise homes that have living quarters and utilities below the floodplain elevation to above floodplain elevation at an approximate cost of \$15,000.00 per location.	Town of Sullivan Planning Board	\$15,000 per location	Medium
	T/Sullivan#3	Tributary Excavation	Excavation of the Chittenango Creek outlet into Oneida Lake will reduce the restriction as water flows into the outlet, reducing the resistance of the flow.	Town of Sullivan Planning Board	\$48,000	Medium
	T/Sullivan#4	Utilities Elevation for houses along Chittenango Creek.	Houses in the Chittenango Creek area would could eliminate damages caused when the area floods. Raise utilities to an elevation above the 100-year floodplain.	Town of Sullivan Planning Board	\$5,000 per location	Medium
	V/Canastota #1	Canastota Creek Culvert Replacement at Kime's Hardware, RT 5.	The culvert at this location needs to be replaced with one the same size downstream on Canastota Creek in order to handle calculated flows.	Village of Canastota Public Works	\$200,000	Medium
	V/Canastota #2	Canastota Creek Culvert Replacement at Main Street.	The culverts downstream of the Erie canal conducting Canastota Creek through the Village need to be upgraded for to handle calculated flows.	Village of Canastota Public Works	\$350,000	Medium
	V/Canastota #3	Canastota Creek Culvert Replacement Btwn Erie Canal & Main Street.	The new culvert needs to be sized based on the capacity of the Erie canal culvert and the added run-off from the watershed in the village below the Erie Canal.	Village of Canastota Public Works	\$300,000	Medium
	V/Canastota #4	No Name Creek Culvert Design	Improve under-road drainage along No Name Creek within the Village of Canastota. Study needed for the culvert design and sizing of culverts to be install at under-road crossings along No Name Creek within the Village.	Village of Canastota Public Works	\$20,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair,	V/Cazenovia #1	Burr Street/Burton Street Retention Pond	Storm water retention pond is needed to control run-off behind Burr Street during severe storms. This project will reduce the damages and losses associated with flooding during severe storm events.	Village of Cazenovia Public Works	\$250,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
<p>improvements and protection.</p> <p>Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.</p>	V/Cazenovia #2	Install Burr Street Back-flow Structure	Install a back-flow structure to prevent floodwater from Chittenango Creek from back-flowing to Burr Street, in the Village of Cazenovia	Village of Cazenovia Public Works	\$65,000	Medium
	V/Cazenovia #3	Carpenters Pond Emergency Spillway Improvements	The earthen spillway that has been filled in over time, which could result in uncontrolled over-topping during a severe storm event.	Village of Cazenovia Public Works	\$10,000	Medium
	V/Chittenango #1	Valley Acres Drainage Improvement	Construct diversion structures to channel storm water around the development. This will require cooperation with the Town of Sullivan as this is the source of the water.	Village of Chittenango Public Works	\$3,500,000	Medium
	V/Chittenango #2	Chittenango Creek Channel Dredging	Initiate regular maintenance dredging of box culvert under the Old Erie Canal (aqua duct) reduces restrictions at the north end of the village that back-up through the downtown corridor.	Village of Chittenango Public Works	\$20,000	Medium
	V/Chittenango #3	Elevation of Utilities in 100-year floodplain	Approximately 100 residences in the downtown area of the village have their utilities in basements, below the floodplain. Move utilities from below grade elevation to first floor of residential structures.	Village of Chittenango Planning Board	\$500,000	Medium
	V/Chittenango #4	Annual Streambank Survey and Monitoring Program	Annual streambank inspections to identify log-jams, gravel deposits or other conditions which restrict the flow of Chittenango Creek within the Village of Chittenango. Once identified, restrictions are removed by the Village DPW crews, pending any DEC approvals and/or permits.	Village of Chittenango Floodplain Manager/Codes	\$10,000	Medium
	V/DeRuyter#1	Supplemental Culvert under Cemetery Street	Install a 3' by 60' plastic pipe at this location to enhance the flow capacity of the existing 5' by 2' concrete box culvert.	Village of DeRuyter Public Works	\$35,000	Medium
	V/DeRuyter#2	Stream Maintenance Program	Build-up of bed loads and debris restricts the flow of water in streams. Develop a stream maintenance program to inspect and remove obstructions from stream channels, as needed.	Village of DeRuyter Public Works	\$5,000	Medium
	V/Earlville#1	Drainage and Pump System for Preston & Clyde Streets	Design and install drainage and pump system to capture and remove stormwater from Preston & Cole Streets, in the Village of Earlville.	Village of Earlville	\$24,000	Medium

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
Standby Power.	V/Earlville#2	Standby generator for fire department/Village Offices	Village of Earlville volunteer fire department does not currently have back-up power generation capabilities. The fire department is co-located with the Village of Earlville offices.	Village of Earlville Fire Dept.	\$35,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair,	V/Madison#1	South Street Flooding	Replace existing double pipe culvert with a single box culvert of appropriate size to handle calculated flows.	Village of Madison Public Works	\$30,000	Medium
Standby Power.	V/Madison#2	Fire Department Standby Generator	Village of Madison volunteer fire department and ambulance corps does not currently have back-up power generation capabilities. The fire department is co-located with the Village of Madison offices.	Village of Madison Fire Department	\$35,000	Medium
Reduce vulnerability of existing infrastructure assets and critical facilities from flood damage through repair, improvements and protection.	V/Munnsville #1	East Hill Road Streambank Stabilization	Stabilize streambank and channel to reduce restrictions in flow, in the Village of Munnsville.	Village of Munnsville	\$50,000	Medium
	V/Munnsville #2	Park Street Drainage Plan	Develop a plan to correct flooding issues. This is on private property. Madison County Soil & Water Conservation District has offered to develop the plan following the recommendation identified in the study	Village of Munnsville & MCSWCD	TBD	Medium
	V/Munnsville #3	Oneida Creek Streambank Stabilization	Stabilize along east side of Oneida Creek streambank, north of East Hill Road. This will protect one house from loss or damage from a severe storm event.	Village of Munnsville	\$80,000	Medium
	V/Wampsville #1	Kay Drive Dry Well	By installing a dry well, water pumped from basement sump pumps would be collected at a central point where it will filter into the ground at a location that wouldn't infiltrate back into basement walls.	Village of Wampsville	\$3,500	Medium
	V/Wampsville #2	Stream Channel Excavation behind Christina Drive	Reduce restrictions preventing storm water from flowing in the area of Christina Drive in the Village of Wampsville.	Village of Wampsville & Madison County Highway Dept.	\$8,600	Medium
	T/Lenox #1	Main Street Culvert Repairs	The project will lower the height of the existing culvert to prevent water from backing up endangering six houses.	Town of Lenox Highway Dept.	\$3,600	High

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STRATEGY	PROJECT #	PROJECT NAME	PROJECT DESCRIPTION	LEAD AGENCY OR PROPONENT	ESTIMATED COSTS	PRIORITY
	T/Lenox #2	Lewis Point Road Flooding Planning	Due to the current height of the culvert at this location water must back up to the height of the culvert. This backs up water during severe storms.	Town of Lenox Highway Dept.	\$25,000	Medium
	T/Lincoln #1	Cottons Rd Culvert Repairs	The project will replace the existing culvert with one of proper sizing to handle calculated flows. A runoff estimate and culvert sizing will be done by Soil & Water staff	Town of Lincoln Highway Dept. & MCSWCD	\$75,000	Medium
	T/Lincoln #2	Nelson Rd Culvert Repairs	The project will replace the existing culvert with one of proper sizing to handle calculated flows. A runoff estimate and culvert sizing will be done by Soil & Water staff at no cost to the Town.	Town of Lincoln Highway Dept. & MCSWCD	\$12,500	High
	V/Hamilton #1	Woodman Pond Bank Stabilization	Conduct a cost study by a qualified engineer to determine the cost of rehabilitating the banks of Woodman Pond.	Village of Hamilton DPW	\$25,000	Medium
	V/Hamilton #2	Fire Department Lake Moraine Dam Breach Plan	Develop an emergency response plan to address mass warning, evacuation routes, sheltering, and public education in the event of major flooding resulting from the dam breaching at Lake Moraine.	Village of Hamilton DPW	\$10,000	Medium