

SECTION 6: MITIGATION STRATEGIES

This section presents mitigation actions for Tioga 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 these mitigation actions, which are presented herein.

This section includes:

- (1) Background and past mitigation accomplishments
- (2) 2006 Hazard Mitigation Strategy Update
- (3) General mitigation planning approach
- (4) Plan mitigation goals and objectives and an explanation of the updated Goals and Objectives process
- (5) Identification, analysis, and prioritization guidelines for potential mitigation actions

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 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.

All jurisdictions participating in this Plan participate in the NFIP, which requires the adoption of FEMA floodplain mapping and certain minimum construction standards for building within the floodplain.

A summary of progress of mitigation actions included in the 2006 Tioga County Hazard Mitigation Plan is provided below (Table 6-1). In the case of projects that were not completed an explanation of obstacles has been provided. Projects that have not been commenced and those that are partially complete have been included in the mitigation strategies in Volume II of this plan as appropriate.

Table 6-1. Summary of Progress of Mitigation Actions for Tioga County

Priority	Project Description	Project Status	Notes
County-wide Projects			
1	<i>Hydrological study</i> of the total watershed including having the county flown by <i>LiDAR</i> in order to generate more accurate floodplain maps and reduce cost of flood insurance for residents.	Flight completed – coverage for approximately 85% of the County	Portions of the Town of Spencer have been flown by <i>LiDAR</i> including Sulphur Springs and Hulbert Hollow watersheds (funded by the Town of Spencer). Also sections of Owego Creek have been flown. <i>LiDAR</i> has been flown for the majority of the by FEMA in an effort to update flood maps.
2	<i>Streambed maintenance program</i> within each municipality as well as an active <i>road ditch program</i> .	In Progress (50%)	Several municipalities in the County have Memorandum of Understandings (MOUs) with NYS DEC to complete routine stream maintenance 50' above and below culverts, bridges, etc. <i>These must be renewed yearly.</i> <i>Town of Tioga, Barton, Candor, Newark Valley and County Highway all have current MOUs with DEC.</i> Each municipality has an active road ditch

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Priority	Project Description	Project Status	Notes
			<p>maintenance program. Some use SWCD hydroseeder to reseed road ditches. Municipalities utilize Cornell Local Roads Program. Need to conduct more training on proper road maintenance and promote utilization of hydroseeding program.</p> <p>District proposing a series of Highway personnel training for proper stream maintenance techniques. Most highway depts. contact SWCD prior to initiating work in streams for necessary permits.</p> <p>Need to look into alternate methods to road ditches such as catchment basins in order to allow water to infiltrate into the ground recharging the water table.</p> <p>5 Highway Depts participated in an Environmentally Sensitive Maintenance of Stream Workshop in Jan '08.</p> <p>District attended Highway Assoc. Mtg in Feb. '08 to review hydro-seeding grant and stream technical assistance available.</p>
Township Specific Projects			
3	Town of Spencer - <i>Hulbert Hollow control dam in headwaters, Rosgen Method (natural stream restoration) used for stream bank protection along with wetlands restoration above Spencer Lake.</i>	Incomplete No progress	The USC has been working with the Finger Lakes Land Trust to purchase property above Spencer Lake for a wetland complex. FLLT is still interested in the property but interest of current owner is questionable.
4	Town of Spencer – <i>Rebuilding of Spencer Lake Dam</i>	Incomplete (0%)	Privately owned lake; financial concerns. Letter sent by NYSDEC stating it's a Grade B Hazard Dam and needs to be fixed or breached. USC has stated that they would assist the landowner in fixing the dam if for flood retention or wetland purposes. In permitting phase to remove dam
5	Town of Spencer – <i>Acquire property along Sulphur Springs Creek and install 4 drop structures approximately 200 yards apart in order to capture sediment and gravel moving through the system before it reaches Catatonk Creek main stem.</i>	Incomplete (0%)	Other projects that have been completed in the watershed include: State DOT installed Cross vein just above Rt 96 Bridge and V-weir installed 2006-2007.
6	Town of Tioga – <i>Flood proofing of homes where Catatonk Creek and Owego Creek join. Occurs on a rare basis, suggest elevating homes or relocating utilities to higher locations in the house.</i>	Complete (100%)	Flooding in this area was also caused by a severely eroding bank up stream on Owego Creek (North of Rte 96) that allowed water to leave the stream channel follow along the RR tracks and flood properties on 96. In 2005 the stream bank was stabilized using EWP monies, had flooding has been significantly reduced to the area since this time.
7	Village of Owego – <i>Extension of dike installed originally by ACE along Owego Creek (approximately 200 yards). Reoccurring flooding along the mouth of Owego Creek and</i>	In progress 2006 buyout complete	Village of Owego currently looking for funding source to have an engineering firm conduct a hydrologic analysis in order to show that constructing the berm will not affect the floodplain. Project would also include patching sections of the berm that have been erode. Will be part of the

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Priority	Project Description	Project Status	Notes
	<i>Susquehanna River</i> – proposed to enroll homes in the FEMA buyout program.		Long Term Recovery grant Village is involved in. Six homes 7 structures in this area have applied for the FEMA buyout program after the June 2006 flood. Complete
8	Town of Tioga – <i>Pipe Creek needs to be studied using the Rosgen method in order to stabilize sections of the stream.</i>	Smaller projects on Pipe Creek in progress.	Tioga County SWCD has secured funding for several stabilization projects to occur in the Pipe Creek Watershed. In 2007, 3000 feet of streambank on Pipe Creek was mitigated after improper maintenance of the stream occurred. Looking for additional funding sources to address lower stretch of Pipe Creek
9	Town of Nichols - <i>Wappasening Creek needs to be studied using the Rosgen method in order to stabilize sections of the stream.</i>	Incomplete (0%)	Several smaller projects have occurred towards the mouth of Wappasening Creek, these have been undertaken to remove gravel and stabilize a portion of the stream. Further work needs to be done on upper portions of the stream.
10	Village of Waverly – <i>Cayuta Creek needs to be reestablished to original streambed and stabilized via Rosgen Method.</i>	Incomplete (0%)	No Funding
11	Village of Waverly – <i>Dry Brook Creek restore dam to pre 1973 capacity to lessen flooding. Replace undersize culvert under Broad Street.</i>	Incomplete (0%)	Consequences of NYS DEC new dam regulations. _ NO FUNDING

In addition to structural projects, Tioga County has embarked on community education to increase flood awareness by installing signage indicating past flood levels in public areas. Below are photos of Tioga County’s community flood hazard signs at Glenmary Drive and Ransom Park.

Figure 6-1. Photograph of the Flood Hazard Sign at Glenmary Drive



Source: Tioga County

Figure 6-2. Photograph of the Flood Hazard Sign at Ransom Park



Source: Tioga County

These past and ongoing activities have contributed to the County’s understanding of its hazard preparedness and future mitigation activity needs, costs, and benefits. These efforts provide a foundation for the Planning Committee to use in developing this HMP.

GENERAL MITIGATION PLANNING APPROACH

The general mitigation planning approach used to develop this plan is based on the FEMA publication, Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3) and input provided by NYSOEM. The FEMA document and NYSOEM guidance include four steps, which were used to support mitigation planning. These steps are summarized below and presented in more detail in the following sections.

- **Develop mitigation goals and objectives:** Mitigation goals were developed using the hazard characteristics, inventory, and findings of the risk assessment, and through the results of the public outreach program. By reviewing these outputs and other municipal policy documents, objectives tying to these overarching goals were identified and characterized into similar themes.
- **Identify and prioritize mitigation actions:** Based on the risk assessment outputs, the mitigation goals and objectives, existing literature and resources, and input from the participating entities, alternative mitigation actions were identified. The potential mitigation actions were qualitatively evaluated against the mitigation goals and objectives and other evaluation criteria. They were then prioritized into three categories: high, medium, and low.
- **Prepare an implementation strategy:** High priority mitigation actions are recommended for first consideration for implementation, as discussed under each hazard description in the following sections. However, based on community-specific needs and goals and available funding and costs, some low or medium priority mitigation actions may also be addressed or could be addressed before some of the high priority actions.
- **Document the mitigation planning process:** The mitigation planning process is documented throughout this Plan.

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

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

FEMA defines **Mitigation Actions** as specific actions that help to achieve the mitigation

Guiding Principle, Mitigation Goals and Objectives

This section presents the guiding principle for this Plan, and mitigation goals and objectives identified to reduce or avoid long-term vulnerabilities to the identified hazards.

Mission Statement

Per FEMA guidance (386-1), a mission statement or guiding principle describes the overall duty and purpose of the planning process, and serves to identify the principle message of the plan. It focuses or constrains the range of goals and objectives identified. This is not a goal because it does not describe outcomes. Tioga County’s mission statement is broad in scope, and provides a direction for the Plan.

The mission statement for the Tioga County Plan is as follows:



Through partnerships and careful planning, identify and reduce the vulnerability to natural hazards in order to protect the general health, safety, welfare, quality of life, environment, and economy of the residents and communities within Tioga County.

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 Planning Committee developed mitigation goals and objectives based on the risk assessment results, discussions, research, and input from amongst the committee, existing authorities, polices, 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, objectives that meet multiple goals were selected through a similar 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).

Tioga County goals are compatible with the needs and goals expressed in other available community planning documents as well as the NYS HMP. The planning documents reviewed to develop Tioga County’s goals and ensure they are reasonably in-line with goals established in other related planning documents and mechanisms include:

- New York State Hazard Mitigation Plan
- 2006 Tioga County Hazard Mitigation Plan
- Tioga County Comprehensive Emergency Management Plan
- Municipal Comprehensive Plans of participants

Each goal has a number of corresponding objectives that further define the specific actions or implementation steps. Achievement of these goals will define the effectiveness of a mitigation strategy. The goals also are used to help establish priorities.

Objectives were then developed and/or selected by the Planning Committee through its knowledge of the local area, review of past efforts, findings of the risk assessment, qualitative evaluations, and identification of mitigation options. The objectives are used to 1) measure the success of the Plan once implemented, and 2) to help prioritize identified mitigation actions. For the purposes of this Plan, objectives are defined as follows:

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.

The Planning Committee selected objectives that would meet multiple goals, as listed below. The objectives serve as a stand-alone 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.

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Through a facilitated workshop, the planning committee reviewed the 2006 Hazard Mitigation Plan goals and created a crosswalk to indicate how the original goals would be incorporated into the new goal hierarchy as shown below (Table 6-2).

Table 6-2. 2006 Hazard Mitigation Plan Goals and Objectives Crosswalk

Goal and Objectives – From 2006 FEMA-Approved Plan	Keep/Still Applies? (Yes/No – if “No” then please provide your reason)	Modify As Follows
Flood		
G-Reduce the impact of floods on the population of Tioga County and existing developed areas;	Included in revised goals 1 and 3.	NA
G-Reduce the impact of flooding on the local railroad and highway infrastructure;	Included in revised goals 1 and 3.	NA
G-Improve the capacity of rivers and streams to carry and store floodwaters through improvements to stream courses, preservation of natural floodplains and improving natural floodplain resources.	Will be included as an objective under goals 1 and 4.	NA
O-Obtain a thorough understanding of the hydrology of the Owego Creek and Catatonk Creek watersheds. Creek watersheds;	Will be included as an objective under goals 1 and 4.	NA
O-Upgrade and update the floodplain mapping information for all areas of Tioga County.	Included in objective 1-4 and will be included as a more specific action item in the County mitigation strategy.	NA
O-Improve floodwater detention capacities for specific streams.	Will be included as an objective under goals 1 and 4.	NA
O-Maintain the capacity of streams to carry floodwaters effectively through routine clearance of debris and other obstacles and maintain the capacities of roadside ditches and other stormwater management facilities along local roads and highways.	Will be included as an action item in the County mitigation strategy.	NA
O-Reduce repetitive property losses due to flooding.	Included in revised goals 1 and 3.	NA
Wind		
G-Reduce the potential for damage to private property from wind events.	Included in revised goals 1 and 3.	NA
G-Reduce the potential for personal injury to residents during wind events.	Included in revised goals 1 and 3.	NA

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Goal and Objectives – From 2006 FEMA-Approved Plan	Keep/Still Applies? (Yes/No – if “No” then please provide your reason)	Modify As Follows
O- Local government implementation of up-to-date building standards for new construction county-wide.	Included in revised goal 1, 3 and 5.	NA
O- Develop programs to encouraging owners of older structures to retrofit their properties to increase their resistance to high winds and tornadoes.	Included in revised goal 1, 3 and 5.	NA
O- Maintain up-to-date weather forecasting and emergency public notification capabilities.	Included in revised goal 1 and 5. (1-9)	NA
O- Develop educational initiatives that would inform the general public about emergency notification, and how to respond when windstorms or tornadoes approach.	Included in revised goals 1, 2, and 3	NA
Snow and Ice		
G-Reduce the potential for damage to private property.	Included in revised goal 1, 3 and 5.	NA
G-Reduce the potential for personal injury.	Included in revised goal 1, 3 and 5.	NA
G-Ensure that public works departments are equipped to effectively and efficiently maintain local transportation systems and other key infrastructure resources.	Included in revised goal 3.	NA
O- Develop programs to educate residents and businesses on recommended ways to prepare for and respond to winter storm events, including potential related power failures.	Included in revised goal 1, 2, 3 and 5.	NA
O- Develop educational initiatives that would inform the general public about dangers associated with snow- or ice storm events and safety precautions they should take.	Included in revised goal 1, 2, 3 and 5.	NA
O- Maintain up-to-date capabilities in weather forecasting and storm tracking to ensure adequate notice of an approaching snow- or ice storm event.	Included under revised goal 6.	NA
O-. Identify and correct deficiencies in equipment and other response capabilities.	Included under revised goal 6.	NA
Landslide		



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Goal and Objectives – From 2006 FEMA-Approved Plan	Keep/Still Applies? (Yes/No – if “No” then please provide your reason)	Modify As Follows
G-Reduce potential losses to private property and public infrastructure caused by landslides.	Included in revised goals 1 and 3.	NA
G- Reduce potential for stream erosion-induced landslides and resulting erosion and sedimentation problems downstream.	Will be included as an action item in the County mitigation strategy.	NA
O- Continue stream rehabilitation projects that control streambank erosion and emphasize whole-watershed approaches and bioremediation techniques.	Will be included as an action item in the County mitigation strategy.	NA
O- Identify and map all areas where unstable soils on slopes in excess of 15 percent are present and may indicate the potential for landslides and land subsidence.	Will be included as an action item in the County mitigation strategy. Will be included as an action item in the County mitigation strategy.	NA
O- Develop in cooperation with County Planning and local town governments initiatives that better manage land uses in steep slope and landslide-prone areas.	Will be included as an action item in the County mitigation strategy.	NA
O- Develop design guidelines to assist landowners building in steep slope areas in designing and constructing safe and landslide resistant improvements.	Will be included as an action item in the County mitigation strategy.	NA
Fire		
G- Reduce to the extent practicable the potential for losses due to fire.	Included in revised goals 1 and 3.	NA
G- Reduce the potential for catastrophic fires in older downtown areas.	Included in revised goals 1 and 3.	NA
G- Reduce the potential for wildfires.	Included in revised goals 1 and 3.	NA
G- Reduce potential losses from wildfires.	Included in revised goals 1 and 3.	NA
O- Develop programs that encourage owners of older downtown commercial buildings to maintain their buildings and where feasible update them to increase their fire resistance.	Included under revised goal 6.	NA
O- County-wide enforcement of up-to-date building codes and fire prevention codes for new construction by local code enforcement officers.	Included under revised goal 6.	NA
O- Develop programs to reduce the potential for wildfires occurring through public education regarding the danger of wildfires and the common causes of them.	Included under revised goal 6.	NA
O- Ensure that local fire departments possess adequate resources to fight such fires, including resources available through mutual aid.	Included under revised goal 6.	NA

Goal and Objectives – From 2006 FEMA-Approved Plan	Keep/Still Applies? (Yes/No – if “No” then please provide your reason)	Modify As Follows
O- Develop programs to encourage woodlot owners to manage their woodland in a manner that reduces the potential for large wildfires while enhancing its productivity as timber land.	Will be included as an action item in the County mitigation strategy.	NA

The following are the mitigation goals and objectives for the Tioga County Plan:

<p>Goal 1. Protect Life and Property</p> <p><i>Objective 1-1:</i> Protect critical facilities and infrastructure.</p> <p><i>Objective 1-2:</i> Address repetitive and severe repetitive loss properties throughout the County.</p> <p><i>Objective 1-3:</i> Encourage the establishment of policies to help ensure the prioritization and implementation of mitigation actions and/or projects designed to benefit essential facilities, services, and infrastructure.</p> <p><i>Objective 1-5:</i> Implement mitigation actions that enhance the capabilities of the County to better profile and assess exposure of hazards including update of mapping information.</p> <p><i>Objective 1-5:</i> Improve the understanding the hydrology of major rivers and streams and improve capacity of these water features to reduce flood vulnerability through improvements to water courses and improving natural floodplain resources.</p> <p><i>Objective 1-6:</i> Develop, maintain, strengthen and promote enforcement of ordinances, regulations, plans and other mechanisms that facilitate hazard mitigation.</p> <p><i>Objective 1-7:</i> Integrate the recommendations of this plan into existing regional and local programs.</p> <p><i>Objective 1-8:</i> Ensure that development is done according to modern and appropriate standards, including the consideration of natural hazard risk.</p> <p><i>Objective 1-9:</i> Identify and pursue funding opportunities to develop and implement local and county mitigation activities.</p> <p><i>Objective 1-10:</i> Improve and Promote detection, warning and communication systems.</p> <p><i>Objective 1-11:</i> Improve communication of emergency directives before, during, and after disaster events.</p> <p>Goal 2. Increase Public Awareness and Preparedness/Understanding of Natural Hazards and their Risks</p> <p><i>Objective 2-1:</i> Develop and implement program(s) to better understand the public’s level of individual and household preparedness.</p> <p><i>Objective 2-2:</i> Develop and implement additional ongoing education and outreach programs to increase public awareness of hazard areas and the risks associated with hazards, and to educate the public on specific, individual preparedness activities and promote awareness among homeowners, renters, and</p>

businesses about obtaining insurance coverage available for natural hazards (i.e., flooding).

Objective 2-3: Implement mitigation actions that enhance the capabilities of the County and communities to better profile and assess exposure of hazards.

Objective 2-4: Create and implement an educational strategy and training component on stream processes and stream corridor management.

Objective 2-5: Provide information on tools, partnership opportunities, funding resources, and current government initiatives to assist in implementing mitigation activities.

Goal 3. Reduce Hazard Impact on the Economy (throughout the County)

Objective 3-1: Where appropriate, coordinate and integrate hazard mitigation actions with existing local emergency operations plans.

Objective 3-2: Promote suitable land development practices.

Objective 3-3: Support education and outreach to businesses to increase the understanding of vulnerability to natural hazards and to reduce potential interruptions in business operations or business closures.

Objective 3-4: Support business awareness of available flood insurance and incentives to mitigate business assets against natural hazards.

Goal 4. Protect Open Space, Agricultural Land, the Environment and Natural Resources

Objective 4-1: Conserve, protect, and enhance streams and river systems so that channels and floodplains provide beneficial functions for flood damage prevention, habitat and water quality.

Objective 4-2: Maintain and restore the connections between streams and their floodplains utilizing science based approaches when stream systems are disturbed.

Objective 4-3: Protect and preserve environmentally sensitive and critical areas.

Objective 4-4: Protect and restore natural lands and features that serve to mitigate losses (including wetlands, floodplains, stream corridors, hillsides and ridge lines). Such lands should be clearly mapped and identified for protection.

Objective 4-5: Continue to preserve, protect and acquire open space, particularly in high hazard areas. Include hazard considerations into the prioritization schema for land acquisition.

Objective 4-6: Promote the continued use of natural systems and features, open space preservation, and land use development planning for natural hazard mitigation activities wherever possible to anticipate and reduce long term costs and maximize hazard mitigation effectiveness.

Goal 5. Promote and Support Partnerships

Objective 5-1: Strengthen inter-jurisdiction and inter-agency communication, coordination, and partnerships to foster hazard mitigation actions and/or projects including encouragement of shared services in acquiring, maintaining, and providing emergency services and equipment.

Objective 5-2: Identify and implement ways to engage public agencies with individual citizens, non-profit organizations, business, and industry to implement mitigation actions more effectively.

Objective 5-3: Coordinate, create, and maintain, where applicable or required, natural hazard mitigation efforts natural risk management activities with adjacent jurisdictions' agencies.

Goal 6. Enhance Emergency Management Preparedness, Response, and Recovery

Objective 6-1: Encourage the establishment of policies to help ensure the prioritization and implementation of mitigation actions and/or projects designed to benefit essential facilities, services, and infrastructure.

Objective 6-2: Identify the need for, and acquire, any special emergency services, training, equipment, facilities and infrastructure to enhance response capabilities for specific hazards.

Objective 6-3: Ensure continuity of governmental operations, emergency services, and essential facilities at the local level during and immediately after disaster and hazard events.

Objective 6-4: Maintain and expand shared services in acquiring maintaining and providing emergency services and equipment.

Capability Assessment

According to FEMA 386-3, a capability assessment is an inventory of a community's missions, programs and policies; and an analysis of its capacity to carry them out. This assessment is an integral part of the planning process. It identifies, reviews and analyzes local and state programs, polices, regulations, funding and practices currently in place that may either facilitate or hinder mitigation.

A capability assessment was prepared by Tioga County and each participating jurisdiction. The capability assessments are presented in Section 9, Volume II of this Plan. By completing this assessment, Tioga County and each jurisdiction learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Types of mitigation actions that may be prohibited by law;
- Limitations that may exist on undertaking actions; and
- The range of local and/or state administrative, programmatic, regulatory, financial and technical resources available to assist in implementing their mitigation actions.
- Action is currently outside the scope of capabilities (funding)
- The jurisdiction is not vulnerable to the hazard
- Action is already being implemented

Identification, Prioritization, Analysis, and Implementation of Mitigation Actions

This subsection discusses the identification, prioritization, analysis and implementation of mitigation actions for Tioga County.

Strengths, Weaknesses, Opportunities and Obstacles (SWOO)

On March 26, 2012, a Strengths, Weaknesses, Opportunities, and Obstacles (SWOO) session was held with the Planning Committee. The purpose of this session was to review information garnered from the risk assessment and the public involvement strategy to identify strengths, weaknesses, opportunities and obstacles in hazard mitigation within Tioga County through a facilitated brainstorming session on risks, vulnerabilities, and capabilities. All information shared during this session was recorded and used to prepare catalogs of mitigation alternatives to be used by the Planning Committee in preparing their individual jurisdictional annexes. Many of the strategies (such as community outreach) identified in the catalogs could be applied to multiple hazards. This Plan identifies strategies for multiple hazards for the County and each jurisdictional annex for participating jurisdictions (Section 9).

In order to incorporate comprehensive stakeholder input, the Planning Committee elicited input from a wide range of stakeholders in the form of a stakeholder survey designed to provide a basis for discussion and input on an agency level. Input included obstacles and lessons learned from the 2012 flood event. The survey was distributed to the following agencies and discussions were facilitated by Steering Committee members.

Table 6-3. Agencies/Stakeholders

Agency/Stakeholder
Apalachin Fire Department
Tioga County Sheriff Department
Town of Tioga EMS
Town of Tioga Fire Department
Town of Tioga Fire Department
Town of Barton Highway Department
New York State Police
Town of Owego Highway Department
Riverview Manor Health Care Center
Town of Sidney Fire Fighters
Weltonville Fire Department
Waverly Barton Fire District

Survey responses were then collated and incorporated into the SWOO discussion and ultimately into the catalog of mitigation actions. The Planning Committee generated a comprehensive list of mitigation actions (see Appendix D) to be considered that met the following objectives:

- Use information obtained from the public involvement strategy;
- Use information provided in the risk assessment;
- Seek mitigation actions consistent with the goals and objectives for the Tioga County Plan;
- Create catalogs of mitigation actions to be used as a tool by the Planning Committee in selection of mitigation actions.

Catalogs of Mitigation Actions

Based on information gathered during the SWOO session, catalogs of mitigation actions were created that list initiatives that could manipulate the hazard, reduce exposure to the hazard, reduce vulnerability to the hazard, and increase the Planning Committee’s ability to respond to or be prepared for a hazard (Appendix D). These catalogs are separated by responsibility for implementation (i.e., who would most likely implement the initiative: personal property owners, private sector business, or government). The

hazards addressed by the catalogs were deemed to be those to which the planning area is most vulnerable based on the risk assessment.

The catalogs are not meant to be exhaustive or site-specific but rather to inspire thought and provide members of the Planning Committee a baseline of initiatives backed by a planning process, consistent with the goals and objectives of the planning area, and within the capabilities of the Partners. The Planning Committee was not bound to these actions. They could have added to the catalogs if an action was not included. Actions in the catalogs that were not selected by the Partners in their jurisdictional annexes were not selected based on the following:

- Action is currently outside the scope of capabilities (funding)
- The jurisdiction is not vulnerable to the hazard
- Action is already being implemented

All proposed mitigation actions were identified in relation to the goals and objectives presented above. The mitigation actions include a range of options in line with the six types of mitigation actions described in FEMA guidance (FEMA 386-3), including:

- 1. Prevention:** Government, administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- 2. Property Protection:** Actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- 3. Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- 4. Natural Resource Protection:** Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- 5. Emergency Services:** Actions that protect people and property, during and immediately following, a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.
- 6. Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.

Mitigation Actions

The mitigation actions are the key element of the natural hazards mitigation plan. It is through the implementation of these actions that Tioga County and the participating jurisdictions can strive to become

disaster-resistant through sustainable hazard mitigation. For the purposes of this Plan, mitigation actions are defined as follows:

Mitigation actions are activities designed to reduce or eliminate losses resulting from natural hazards.

Although one of the driving influences for preparing this Plan was grant funding eligibility, its purpose is more than just access to federal funding. It was important to the Planning Committee to look at mitigation actions that will work through all phases of emergency management. Some of the actions outlined in this Plan may not be grant eligible—grant eligibility was not the focus of the selection. Rather, the focus was the actions' effectiveness in achieving the goals of the Plan and whether they are within the County or each jurisdiction's capabilities.

A series of mitigation actions were identified by Tioga County and each participating jurisdiction. These actions are summarized in Section 9, Volume II of this Plan. Along with the hazards mitigated, goals and objectives met, lead agency, estimated cost, potential funding sources and the proposed timeline are identified. The parameters for the timeline are as follows:

- Short Term = To be completed in 1 to 5 years
- Long Term = To be completed in greater than 5 years
- Ongoing = Currently being funded and implemented under existing programs.

Prioritization

Section 201.c.3.iii of 44 CFR requires an action plan describing how the actions identified will be prioritized. The Tioga County Planning Committee, along with their contract consultant, developed a prioritization methodology for the Plan that meets the needs of the County and participating jurisdictions while at the same time meeting the requirements of Section 201.6 of 44 CFR. The mitigation actions identified were prioritized according to the criteria defined below.

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

It should be noted that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this Plan will be reviewed and updated as needed annually through the plan maintenance strategy described in Section 6 of this Plan.

Benefit/Cost Review

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. The County was asked to weigh the estimated benefits of a project versus the estimated costs to establish a parameter to be used in the prioritization of a project, utilizing the same parameters used by each of the participating jurisdictions as outlined in Volume II of this Plan.

This benefit/cost review was qualitative; that is, it did not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. This qualitative approach was used because projects may not be implemented for up to 10 years, and the associated costs and benefits could change dramatically in that time. Each project was assessed by assigning subjective ratings (high, medium, and low) to its costs and benefits, described in Table 6-4:

Table 6-4. Cost and Benefit Definitions

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

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly. For many of the County initiatives identified, Tioga County may seek financial assistance under FEMA’s HMGP or PDM programs. Both of these programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed when funding applications are prepared, using the FEMA model process. The Planning Committee is committed to implementing mitigation strategies with benefits that exceed costs. For projects not seeking financial assistance from grant programs that require this sort of analysis, the Planning Committee reserves the right to define “benefits” according to parameters that meet its needs and the goals and objectives of this plan.

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

The annexes presented in Section 9, Volume II present the results of applying the prioritization methodology presented to the set of mitigation actions identified by Tioga County and each participating jurisdiction, and includes the following prioritization parameters:

- Number of objectives met by the initiative
- Benefits of the project (high, medium, or low)
- Cost of the project (high, medium, or low)
- Do the benefits equal or exceed the costs?
- Is the project grant-eligible?
- Can the project be funded under existing programs and budgets?
- Priority (high, medium, or low)

The annexes in Section 9, Volume II of this Plan present the County's and each participating jurisdiction's mitigation action implementation strategy including:

- Mitigation actions for individual and multiple hazards
- Mitigation objectives supported by each action. Goals are not listed because all objectives meet multiple goals.
- Implementation priority
- Potential funding sources for the mitigation action (grant programs, current operating budgets or funding, or the agency or jurisdiction that will supply the funding; additional potential funding resources are identified)
- Estimated budget for the mitigation action (financial requirements for new funding or indication that the action is addressed under current operating budgets)
- Time estimated to implement and complete the mitigation action
- Existing policies, programs, and resources to support implementation of the mitigation action (additional policies, programs, and resources identified)

Specific mitigation actions were identified to prevent future losses; however, current funding is not identified for all of these actions at present. Tioga County has limited resources to take on new responsibilities or projects. The implementation of these mitigation actions is dependent on the approval of the local elected governing body and the ability of the community to obtain funding from local or outside sources. Where such actions are high priorities, the community will work together with NYSOEM, FEMA and other Federal, State and County agencies to secure funds.

In general, mitigation actions ranked as high priorities will be addressed first. However, medium or even low priority mitigation actions will be considered for concurrent implementation. Therefore, the ranking levels should be considered as a first-cut, preliminary ranking and will evolve based on input from Tioga County departments and representatives, the public, NYSOEM, and FEMA as the Plan is implemented.